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ABSTRACT

This document consists of the two issues (1/2 and 3/4) of the Journal of the Society for Accelerative Learning and Teaching published during 1992. Articles in these issues include: "Hemispheric Preference, Intelligence and Creative Interests" (John W. Zimmer, David Guip, Dean L. Meinke, Dennis J. Hocevar); "Reading Test Anxiety with the Swish" (Harry E. Stanton); "The Evolution of Accelerative Learning from Lozanov to the Present" (Uschi Felix); "Relaxation Training Effects on Anxiety and Academic Performance" (Pedro R. Portes, Susan M. Best, Daya Sandhu, Tito Cuentas); "Improving Science Education: An Integrative Approach" (Joseph Jesunathadas); "Reading and Learning Disabled Students Improve Reading and Math through Videoed Analytical Training" (Jan Erland); "Suggestopedia's Evolution in the West and in the East" (Galina Kitaigorodskaya); "Description of Five Counseling Cases with Lozanov's Memory Technique (Johnny M. Young, Daya S. Sandhu); "Using the Right Brain To Teach Writing" (Richard Jewell); and "Speed Reading Improves SALT Achievement Much More" (Hideo Seki). (MSE)

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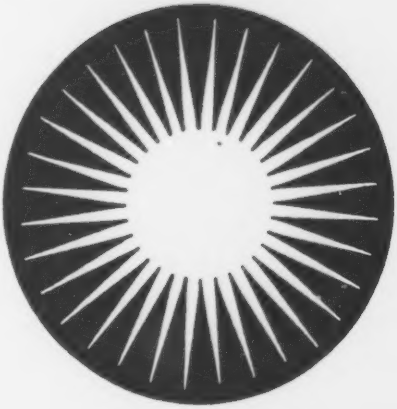

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Call for Papers

Pedro R. Portes
Journal Editor

The *Journal of the Society for Accelerated Learning and Teaching*, an international and multi-disciplinary publication, publishes original articles that advance theory and educational practices in learning, instruction and development. Appropriate papers include (1) those that advance suggestopedia, sociocultural and brain-based theoretical models of cognitive development, (2) summaries of programmatic research, (3) applications and empirical evaluations of instructional methods that advance development, and (4) provocative findings and analyses which bear on established psychological paradigms. The journal also welcomes *incisive* book reviews and in-depth critical analyses of recognized existing theory that centers on the socio-historical and biological aspects of human development.

J. of the Society for Accelerative Learning and Teaching,
Spring, 1992, 17(1)

Hemispheric Preference, Intelligence and Creative Interests

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Abstract. In a study assessing students applying for a program for the artistically gifted and talented, the Style of Learning and Thinking (SOLAT), the Group Inventory for Finding Interests (GIFFI) and the Otis-Lennon Intelligence Test (O-L) were administered to explore relationships among hemispheric preference, creative interests and intelligence. Additionally, the study examined a modified scoring strategy for the SOLAT which evaluated an explicit preference for hemispheric functioning. Results obtained indicated significant correlations between right hemispheric preference and GIFFI rating. Integrated functioning (the explicit pre-

ference score) was significantly correlated with GIFFI scores, while O-L and SOLAT subscore (Left, Right, and Integrated) correlations were only significant for integrated functioning. Results were discussed in terms of the dangers of directly transferring concepts and procedures established for one discipline to another, especially given the variable and somewhat counter-intuitive findings obtained.

Introduction. The search for techniques and strategies to identify creative individuals has been one of the most frustrating in psychology and measurement. Conflicting definitions and classifications abound, with efforts to consolidate assessment procedures or build predictive models subject to the vagaries of current theories of creativity. Additionally, from a measurement perspective, available methodologies/instruments lack both divergent and convergent validity which suggests these procedures do not differentiate creativity from other psychological constructs in any meaningful way (Zimmer, Guip and Hocevar, 1988; Hocevar and Bachelor, 1989).

In general, criticisms of efforts to identify generically creative individuals are doubly applicable to identification of the artistically talented (Clark and Zimmerman, 1984). Attempts to identify artistic ability as a construct separate from intelligence or academic creativity have run into problems in operationalization and standard setting, as well as the more technical limitations of reliability and validity. With the passage of enabling legislation (Gifted and Talented Children's Act of 1978) and state directives to school systems, attempts to identify gifted/talented/creative students have become something of a cottage industry, generating a spate of traditional and non-traditional approaches to the study of creativity. Of note for the present investigation is the use of standardized preference surveys to ascertain differences in attitudes/behaviors between creative and non-creative individuals as well as more theoretically speculative procedures which allegedly employ concepts from cognitive science and neuropsychology.

Two widely used instruments reflecting these approaches are the Group Inventory for Finding Interests (GIFFI) and the Style of

Learning and Thinking (SOLAT), developed by Rimm and Davis (1980) and Torrance (1988) respectively. The GIFFI is reportedly useful in identifying attitudes and interests commonly associated with creativity and is used as a screening device for a variety of programs for the gifted and talented. Although study results are somewhat mixed (see Zimmer, et al., 1988; Rimm and Davis, 1976) the widespread use of the GIFFI as a mechanism for selecting participants for gifted and talented programs would seem to warrant additional analyses. The Torrance scale (SOLAT) is a somewhat more interesting instrument, which purportedly relies on recent findings from brain research and cognitive science. An underlying rationale for the SOLAT is research suggesting that hemispheric structures of the brain have different functions, of which one (right hemisphere functioning) might predict "creativity" (although Gardner, 1982, has a very different conceptualization). The artistically talented are said to be more "intuitive," less logical, more "form-like" in thinking and better able to use patterns versus words. Since these elements are supposedly the realm of the right hemisphere, those with right "cerebral dominance" are said to be, at least potentially, more creative (particularly artistically creative). Although neuropsychologists are singularly reluctant to reify the contentions underlying these instruments and approaches, that has not stopped curriculum developers and instructional personnel from asserting that, "Unicorns are real. . . ." (Vitale, 1978) and subsequently designing and incorporating selected elements in selection and instruction. Thus, as in the case of the GIFFI, further exploration of these claims is warranted, especially with the use of both categories of instrument in screening and research procedures with gifted and talented students.

The present investigation was a preliminary attempt to compare and contrast these two representative instruments with a sample of students applying for a program for the artistically gifted and talented. Additionally, since much of the research in creativity has taken on what Sternberg (1988) calls ". . . the role of prodigal stepbrother. . ." to research in intelligence, we incorporated a measure of intellectual functioning (the Otis-Lennon) to ascertain the interaction of I.Q. with both interests and hemispheric preferences.

Specific hypotheses for the investigation were that; a) scores on the creativity subscales of the GIFFI should correlate positively with right hemisphere functioning, and b) these same scores should correlate negatively (or at least neutrally) with left hemisphere functioning. An explicit rationale for these predictions is provided by Torrance (1988). A further purpose was to introduce scoring modifications which incorporate information about relative levels of left and right hemispheric functioning simultaneously, to assess right hemispheric preference (as opposed to overall level of functioning). Our conjecture was that student ratings of right brain preference should correlate positively with Giffi scores.

Analyses, then, were undertaken to determine relationships (if any) between a widely used measure for identifying students ". . . for programs for the creatively gifted (Rimm and Davis, 1980)," and an inventory assessing hemispheric preference developed by one of the best known researchers in creativity, E. Paul Torrance. Overall, our major intent was to evaluate the possible interaction between an instrument for assessing creative interests and another scale which might measure the underpinnings for these interests.

Method

Subjects: Participants in the investigation were 61 nine, ten and eleven year old students (mean age = 10.46) applying to a program for the artistically gifted in a mid-sized public school district. Students (20 males and 41 females) were selected for possible participation in the program on the basis of parent/teacher nomination, achievement and intelligence test scores.

Instruments:

1. The Group Inventory for Finding Interests (GIFFI), a standardized interest inventory for identifying gifted students (Rimm and Davis, 1976). The GIFFI was selected on the basis of its reported reliability, ease of scoring and involvement of art teachers during initial formulation. Test reliabilities are reported to be in the .80 to .86 range (type of reliability was not presented by the

authors), with content validity established by correlating test data with instruments developed by Starkweather, Getzels and Jackson and Torrance, among others (cited by Rimm and Davis, 1976, in their description of the development of the GIFFI). The primary factors assessed by the instrument are curiosity, independence, flexibility, perseverance, and breadth of interests.

Subscales for the GIFFI are: writing/art interest; inventiveness; confidence; imagination; and, many interests. Since the confidence subscale is only peripherally tied to the construct of creativity, and to the other four subscales of the GIFFI, it was omitted from further analyses. The four remaining subscales were summed to yield a total index of creative interests.

2. The Style of Learning and Thinking - Youth Form (SOLAT), adapted by Torrance (1988) from an earlier version developed for adults was used to measure left, right, and integrated brain functioning. Intended for grades 6 through 12, the instrument consists of 28 pairs of items which subjects may rate in four ways; checking one or the other statement, both statements or neither

statement depending on individual perceptions. Each pair of statements has one item representing presumed left brain functioning (e.g., I like school work which has one right way to be done), and one statement representing right brain functioning (e.g., I like to work on a lot of things at one time).

The SOLAT is scored by summing the items classified as representing left-brain behaviors, and summing those statements ostensibly measuring right-brain behaviors. For items where both statements are checked, the scores are summed and interpreted as representing integrated or whole brain functioning. Test scores for each component can then be converted to standard scores or percentile rankings. Test-retest reliabilities reported in the administrator's manual (Torrance, 1988) were: Left = .73; Right = .57; and Total = .47 (Pearson product-moment coefficients). Cronbach alpha reliabilities of .77 for the left scale and .74 for the right scale are also reported. Although validity data for the youth form of the SOLAT are not reported, data from various investigations using the adult form of the instrument are provided.

A major problem with the scoring system for the SOLAT is that it does not explicitly measure a preference for hemispheric functioning. To illustrate, two subjects could receive the same scores on right hemispheric functioning (for example, a score of 10), but could attain very different levels on left hemispheric functioning (for instance, a score of 0 or 10). One subject (with scores of 10-R , and 0-L) clearly has a preference for the right hemisphere, while another subject (with scores of 10-R and 10-L) does not indicate such a preference. Under the present scoring system, this important difference between the two levels of functioning is not analyzed. Accordingly, we introduced a scoring modification that better assesses preferences for right hemisphere functioning. Specifically, we computed the difference between right and left hemispheric functioning, with high negative scores indicating preference for the left hemisphere and high positive scores indicating the reverse.

3. Otis-Lennon Intelligence Test (Otis and Lennon, 1982) scores were also gathered on 39 randomly selected subjects. The O-L was regularly administered to students applying

for entrance to school based gifted/talented programs.

Procedure: The instruments were administered to participants in a group setting according to standard procedures outlined in the respective manuals. The teacher/coordinator of the program presented instructions and instruments over two sessions, since there is overlap between GIFFI and SOLAT items (that is, the instruments ask for similar types of responses). The sessions were conducted approximately one month apart. Intelligence test scores were gathered from student records. Parental permission was obtained for all participants.

Results and Discussion

Overall means and standard deviations for sample characteristics and instrument scores are presented in Table 1.

Table 1. Means and Standard Deviations

	Mean	SD
Control Variables		
Sex (N = 20 males; 41 females)		
Age	10.46	0.92
Predictor Variables		
Left Hemispheric Function	7.16	4.28
Right Hemispheric Function	9.16	4.99
Right Hemispheric Preference	2.00	6.61
Integrated Function	9.26	6.58
Otis-Lennon IQ	127.82	6.88
GIFFI Criterion Variables		
Writing/Art	32.84	7.68
Inventiveness	51.08	8.97
Imagination	33.84	7.06
Interest	54.03	12.46

One relevant statistic from Table 1 is the I.Q. score; with a mean of 127 and a Standard Deviation of 6.9, the range of scores is exceedingly truncated; however, given the posited relationships between I.Q. and hemispheric functioning, we decided to include these analyses.

Table 2 presents second order partialled correlations. Both age and sex were considered.

Table 2. Predictor/criteria and second-order partial correlations, with sex and age held constant

	Predictor Variables				
	LF	RF	RP	IF	IQ
GIFFI Criterion Variables					
Writing/Art	-.19	-.09	.06	.30	.13
Inventiveness	-.35*	-.11	.16	.30*	.26
Imagination	-.36*	-.19	.10	.41*	.10
Interest	-.22	-.26	-.05	.49*	.05
Total Creativity	-.32*	-.21	.07	.46*	.16

NOTE: For IQ, df = 35; for all other correlations, df = 57. LF: Left hem. function, RF: Right hem. function, LF: Left hem. function., RP: Right preference, IF: Integrated functioning.

Control variables. Criterion scales from the GIFFI are indicated on the left of Table 2, with five predictor variables entered across the top of the table, including four scores derived from the SOLAT and Otis-Lennon I.Q. measures.

Several patterns emerged from our analyses: first, all five correlations among left hemisphere functioning are in the predicted direction (negative), with three low, but significant, relationships occurring; second, all correlations between right hemisphere functioning and the GIFFI are insignificant and in the opposite direction (negative) from that predicted, a finding that does not recommend the SOLAT as support for the GIFFI as a measure of creative interests; third, the new scoring technique for ascertaining preference did not reflect current conjecture, since all correlations between right preference and GIFFI scores are insignificant; fourth, relatively strong positive correlations were noted between integrated functioning and the GIFFI subscales; finally, I.Q. did not correlate with any of the GIFFI subscales.

Table 3. indicates the correlations among predictor variables. Of note is the zero correlation between left and right hemisphere functioning, and the fact that I.Q.

correlates negatively with left brain functioning (a somewhat counter-intuitive relationship, in light of the posited role of the left brain in logical and linguistic tasks), but positive for the right preference.

Table 3. Predictor intercorrelations, second-order partial correlations, with sex and age held constant

	LF	RF	RP	IF	P
Left Hemi. Funct.	1.00				
Right Hemi. Funct.	1.00	1.00			
Right Hemi. Pref.	-.67	.74*	1.00		
Integrated Funct.	-.50*	-.73*	.21	1.00	
Otis-Lennon IQ	-.38*	-.14	.07	.34*	.07

NOTE: For IQ, df = 35; for all other correlations, df = 57.

As a primary purpose of the study was to explore the predictive value of the SOLAT with GIFFI scores as criteria, we hypothesized that scores on the creative interests subscales would correlate positively with right hemisphere functioning and negatively (or neutrally) with left hemisphere functioning, only one of which was supported (the negative correlation with left hemisphere scores). Finally, support was evidenced for a positive relationship between integrative brain functioning and creative interests which was not predicted by the hemispheric preference literature

The variable pattern of responses among measures supposedly correlated with, and reportedly predictive of, "creativity" indicate the complexity of the area. Use of measures developed by correlating paper and pencil tasks or by employing concepts from other disciplines (e.g., cognitive neuroscience) which have only face validity when applied to an area as multi-dimensional as creativity will, we believe, continue to generate conflicting data. As Hocevar (1981) and others (notably Gardner, 1982) have suggested, alternatives to the measurement approaches advocated by Rimm and Davis (1976) and Torrance (1988) do exist, specifically, the study of cognitive, life span, and creative lives as discussed by Sternberg and his colleagues (1988).

Additionally, the issue of nomologic validity must be raised; that is, what are the relationships between these various instruments and "real world" samples of creative behavior? In a previous report (Zimmer, et al., 1988), we presented a series of investigations correlating a number of commonly employed instruments with expert ratings of subject generated portfolios. In general, we found virtually no relationship between the "predictive" devices and actual performance, suggesting that, whatever these assessment/selection devices measure, it apparently does not reflect what is necessary to generate actual "creative" works. Finally, the post-hoc development of instruments for gaging sophisticated intra-brain functioning, without at some point relating these devices to physiological measures, is an idle exercise at best. At worst, the use of these approaches for selection and screening purposes magnifies the probability of type-two errors, to the detriment of both research and instruction.

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Preferencia Hemisférica, Inteligencia e Interés Creativo. - En una investigación que valorar los estudiantes quienes aplicaban a un progrma por los dotados artísticamente, el Estilo de Aprender y Pensar (SOLAT), el Inventario Conjuntal por el Discubrir los Intereses (GIFFI), y la Prueba Otis-Lennon de

la Inteligencia (O-L) se administraron para explorar relaciones entre la preferencia hemisférica, los intereses creativos, y la inteligencia. También el estudio examinaba una estrategía modificada de punctuar el SOLAT cual evaluó una preferencia explícita por el funcionamiento hemisférico. Los resultados logrados indicaron correlaciones significativas entre la preferencia dercho-hemisférica y la tasación GIFFI. El functionamiento integrado se correlacionó significativamente con las valoraciones GIFFI, mientras las correlaciones por las subvaloraciones O-L SOLAT (Izquierda, Derecha y Integrada) fueron significativas por solo el functionamiento integrado. Se discutían los resultados en términos de las películas de trasladar directamente los conceptos y procedimientos hechos por una disciplina a una otra, especialmente con los resultados variables y algos contrario-intuitivos logrados.

For further information, contact the first author: Dr. John W. Zimmer, Center for Applied Cognitive Science, University of Toledo, Toledo, OH.

J. of the Society for Accelerative Learning and Teaching,
Spring 1992, 17(1)

Reducing Test Anxiety with the Swish

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Abstract. A Neuro-Linguistic Programming (NLP) rapid change technique, the Swish, is described and its efficacy in the reduction of test anxiety explored both by means of a case study and an empirical investigation. In the latter, 50 high school students were paired on the basis of their Term 2 examination results, members of each pair being allocated at random to one of two groups. The latter was a non-treatment control while the former, an experimental group, experienced two training sessions in the use of the Swish, one of 45 minutes duration and the other, two weeks before the Term 3 examinations, of 25 minutes duration. Comparison of Term 2 and 3 examination results in the six subjects taken in common by the 50 students indicated that the improvement recorded by the experimental group was not matched by that of the control.

Introduction

Using the 30 item Test Anxiety Scale, Sarason, Davidson, Lighthall, Waite, & Ruebush (1960) studied the effects of anxiety on children's examination performance, concluding that those scoring high on the scale tend to focus more attention on their own anxiety responses in test situations than on the task with which they are faced. Thus, should children perceive a situation as being "dangerous" in that it contains cues carrying the message of being evaluated, their performance is likely to be adversely affected.

Evidence, largely anecdotal in nature, supports this view that anxiety about examinations and test-like situations inteferes with performance. Hill (1984) has suggested that as many as 10 million students in elementary and secondary school perform below their true ability on tests because anxiety and deficiencies in test-taking strategies interfere with their performance. Teachers at all educational levels have stories to tell of students who performed very badly in situations characterized by a high degree of stress or anxiety. Many of these students are unable to recall material in the examination room, yet once out of this stress or anxiety-provoking environment, are able to do so with ease. Parents, too, often comment on the extreme nervousness evinced by their children at the mere mention of the word "test".

Although test anxiety continues to be a problem for students at all educational levels (Sarason & Stoops, 1978), desensitization and relaxation procedures have shown some promise in its alleviation (Barabasz 1973; Deffenbacher & Kemper, 1974; Laxer & Walker, 1970; Mann, 1973; Mann & Rosenthal, 1969). Most of these studies have indicated that highly test-anxious students became less anxious following training in relaxation procedures and the working through of a desensitization hierarchy.

Similar success has been achieved both through the use of music (Stanton, 1973) and hypnosis (Stanton, 1977). In the former study, the provision of quiet classical music as students entered the examination room and read their papers enhanced the performance of those who ranked high on test anxiety scales. Primary, secondary and tertiary level students all benefitted in this way. The latter study tested the efficacy of a technique involving relaxation, positive suggestion and imagery which proved to be successful in reducing the test anxiety level of Grade 7 school children, a finding since confirmed at the secondary and tertiary levels. A further study, which also produced positive results, involved the use of the homeopathic remedy, argentum nitricum (Stanton, 1981).

The intervention techniques used in these studies included the external agents of music and argentum nitricum, which may be categorized as outside the control of the student and an internal agent, hypnosis. With this latter technique, subjects are guided into using their inner resources to mitigate test anxiety. This is true also of the Swish, a NLP rapid-change technique (Bandler, 1985) which is the subject of the present article.

Neuro-Linguistic Programming postulates that all behaviour is the result of neurological processes, that neural processes may be represented as models through language and communication systems, and that system components can be organized to achieve specific outcomes (Dilts, et. al.,1980). The model is derived from studies of outstanding therapists such as Milton Erickson, Fritz Perls, and Virginia Satir, and clarifies what it is that effective communicators do, identifying specific tools which can be applied to secure any behavioural outcome. The Swish is one such tool.

Swish technique

The first step in the use of this technique is identification of where or when people would like to behave or respond differently than they are now doing.

Identification of a cue picture, clarifying what it is that people actually see in that situation just before they start doing the behaviour they would like to change is the second step. This should be an associated picture, one that they see as if looking out of their own eyes, but without seeing themselves in it.

Creating an outcome picture comes next, this being a dissociated image of how they would see themselves differently if they had already accomplished the desired change.

This image is to be adjusted until it is really attractive, drawing people to believe strongly that they can make changes in the way they want to.

The actual Swish begins with a person seeing the cue picture big and bright, then mentally placing a small dark image of the outcome picture in its lower right hand corner. This small, dark image is to be mentally "zoomed" so that is grows big and bright, covering the first picture, which will become dim and shrink away. The process must be fast, occupying only one or two seconds. Once the "swish" has taken place, the mental screen is blanked out or the eyes opened. The procedure is repeated a total of five times, each time with a blanking out of the screen or an opening of the eyes at the end of each swish.

The final step is testing. The cue image is pictured and, if the swish has been effective, this will be difficult to do. The picture tends to fade away and be replaced by the second image of the person as he or she wants to be. If this does not occur, the swish pattern is to be repeated.

Case study.

John, a 15 year-old high school student, became extremely nervous whenever he had to sit examinations. Though quite a capable student, John's anxiety interfered with his performance to the extent that his examination marks were always well below those he received for his in-class work. He would have periods during the examination when he would cease writing, being unable to remember material he had learned quite thoroughly.

As a cue picture, seen through his own eyes, John saw an examination paper on the type of small table usually found in rooms used for examinations. In his outcome picture, he saw, himself writing fluently, the ideas flowing onto the paper, his bearing confident and self-assured. This picture he "swished" to replace the cue picture of the examination paper.

After five repetitions of the Swish, John could still clearly imagine his cue picture, though it lacked its original vividness. A further five repetitions resulted in his having great difficulty in bringing it to mind, this being a strong indication that the technique had achieved the desired effect.

In the examination held several weeks later, John's results showed considerable improvements, the marks he gained being comparable to those he was awarded for his assignments and other in-class work.

John is not an isolated case, and this experience provided the stimulus for the more controlled study of the "swish " technique and its possible value in the amelioration of test anxiety which is now outlined.

Subjects and Method

Students, 23 boys and 27 girls, attending a middle-class high school, comprised the subjects of the study. Their ages ranged from 13 to 16 and were included on the basis of their own and their teachers' feeling that their high level of test anxiety had adversely affected their examination performance. Test Anxiety Scale (Sarason & Ganzer,1962) scores of these students all fell in the top third of the range, providing an objective confirmation of the teachers and students subjective judgments.

The average mark recorded by these 50 students on six subjects taken in common at the Term 2 examination was used as the basis for group allocation. Students with approximately the same average score formed pairs, each member of the pair being allocated at random to either an experimental or a non-treatment control group.

The experimental group experienced a single 45-minute group training session in which they learned how to use the Swish technique, this session being conducted in a typical classroom environment. Students used a number of different cue pictures including the sight of examination paper, entry to exam room, sight of students outside examination room and a number of different outcome pictures such as writing effortlessly, receiving good results, and being congratulated by parents.

Training of the experimental group in use of the Swish took place at the beginning of Term 3 with the students being asked to use it with any stimulus which aroused test anxiety within them. Two weeks before the Term 3 examinations, a further 25-minute session was scheduled. At this time they discussed their experience in using the technique, had additional practice, and completed an Anecdotal Report describing their thoughts about the experiment. After the examinations, students wrote a second such report.

Results

After completion of the Term 3 examinations, the average scores on the six subjects taken in common by the 50 students were computed. These were compared with those derived from the Term 2 examinations. Since no sex difference was observed, the result of this comparison for all students is shown in Table 1.

Table 1. Average scores and standard deviations in parentheses for six examinations by time and group

Group	Time of Testing Term 2	 Term 3
Experimental (N = 25)	58.1% (9.6)	67.9% (8.7)
Control (N = 25)	58.4% (9.0)	60.1% (9.3)

* * *   * * *   * * *

Analysis of the data in Table 1 reveals the existence of a highly significant difference between Experimental and Control groups (F [3,96] = 6.34, p < .01). When the two groups are compared on the basis of their Term 3 marks, the performance of the former is significantly higher than that of the latter (Scheffe F = 4.3, df = 24, p < .01).

A comparison of the Experimental group's Term 2 marks with those it recorded in Term 3 also indicates a significant improvement

(Scheffe F = 6.7, df = 24, p < .01). No such improvement was displayed by the Control group.

Discussion

The results of this study indicate that the Swish technique is capable of facilitating short-term improvement in the examination performance of high school students. That it is able to do so on the basis of training occupying only 70 minutes is quite impressive.

However, many psychotherapists still exhibit a profound distrust of brief interventions. Their theory-based training tends to bias them against the concept that important therapeutic gains can be achieved very quickly and they may overlook the actual results gained. If individuals are able to achieve their desired goals, it appears undesirable to ignore the techniques used simply because they do not match conventional theory's expectations of the length of time treatment "should" take.

My own experience with the Swish technique has been very positive. I have found it to be very effective with a wide range of patients, both for the purpose described in this article, the reduction of test-anxiety, and for many other presenting symptoms such as overweight, depression, insomnia, and lack of confidence. Because the technique is so simple, both children and adults are able to learn it quickly and easily. Educators and parents, desirous of effecting change within themselves, are able to use the Swish and to then teach children how to do likewise.

As they made clear in their Anecdotal Reports, the students who were the subjects of the test-anxiety study displayed considerable eagerness to "try out" the technique in as many situations as possible, becoming increasingly enthusiastic as they experienced some success as a result of their efforts. Thus, they were able to approach examinations and other test-like situations with more confidence than had previously been the case. This anecdotal evidence, together with that provided by case studies and the experimental data of the present article, suggests that the Swish technique is one which educational psychologists should consider when endeavouring to help students overcome their test anxiety.

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El Reducir la Ansiedad de Pruebas con el Susurro. - Un téchnico por los Cambios Rápidos del Programa Neuro-Lingüístico (NLP), el Susurro, se describe y su eficaz por el reducir la ansiedad de pruebas se exploraba ambos por un estudio de un caso y una investigación empírica. El el sugundo, 50 estudiantes se parejaron en el basis de sus valoraciones en la prueba segunda, y

miembros de cada pareja se asignaron al azar a un de dos grupos. El segundo fue un control de no-tratar, mientras el primer, el grupo experimental, se experimentó dos sesiones de entrenar en el uso del Susurro, una de 45 minutos y la otra de 25 minutos dos semanas antés del tercer examen. La comparación de los resultados del segundo y tercer examenes en 6 sujetos comunales por los 50 estudiantes indicó que el mejoramiento en el grupo experimental no se igualó por el grupo control.

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The Evolution of Accelerative Learning from Lozanov to the present

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Abstract. The purpose of this paper is to throw light on the confusion and controversy associated with Accelerative Learning. One important flaw in the literature is that names for the different versions of Accelerative Learning are often used interchangeably, and that little attention is given to the exact content of the treatment administered when interpreting research results. This paper provides a detailed description of the evolution of the structure and content of the original version, Suggestopedia, and three major adaptations, Superlearning, SALT and Psychopädie. These are not compared for their relative effectiveness, but changes and contributions made to the original version are identified and the merit of additions to Lozanov's Suggestopedia discussed in the light of the relevant

research findings. An extensive review of the literature revealed important differences between versions. Suggestopedia itself underwent changes, mainly relating to the music selections in the concert sessions. Superlearning reinstated specific relaxation exercises which Lozanov had dropped and included synchronised breathing. Psychopädie included a reproductive phase before the passive concert session. SALT became the most prominent version in the West, largely because publications of research results were more frequent, and its major contribution, the inclusion of mind-calming, appealed to most practitioners in the West.

Introduction. Suggestopedia has been the subject of confusion and controversy. Comments have ranged from the damaging at one extreme (Scovel, 1979, p.258): "....suggestopedy, taken as a self-contained method for language instruction, offers at best nothing much that can be of benefit to present day, eclectic EFL programs, and at worst nothing more than an oversold package of pseudoscientific gobbledygook!" to the fantastic at the other (Ostrander and Schroeder 1979:43): "With the Bulgarian approach, 500 words a day was just 'Mach 1'. By 1966, a group learned 1000 words a day, and by 1974, a rate of 1800 words a day was charted. In 1977, Lozanov reported, some tests showed people capable of absorbing 3000 words per day."

There are several reasons for this confusion and controversy. Originally, the method was shrouded in mystery since only incomplete information was available from Bulgaria. In this environment, the popular press was quick to sensationalise the isolated bits of research which became available, a practice continued by some commercial enterprises for better advertisement of their courses. Finally, a number of different versions of the approach emerged, some contributing substantial changes to Lozanov's original Suggestopedia. Descriptors for the approach are now often used interchangeably, with Superlearning (Ostrander and Schroeder, 1979) being fa-voured in commercial courses, while Sugges-topedia and especially SALT (Schuster and Gritton, 1986) are the versions most frequently used in experimental research.

When interpreting research results, it is important to know precisely what form of experimental treatment was used, since the inclusion of visualisation techniques (SALT) or synchronised breathing (Superlearning), for example, may have an effect not otherwise associated with Suggestopedia. Unfortunately not all studies give a detailed description of the treatment used. Furthermore terms, especially Superlearning and Suggestopedia, tend to be used as synonyms even though there exist clear distinctions between the two approaches.

One important element missing in the research is a precise description of the evolution of Suggestopedia since its inception by Lozanov in the 1960s to the present day. Bancroft (1978a,b), Gassner-Roberts (1986a,b) and Strudel (1986) point to different versions of Suggestopedia, and Bayuk (1983) discusses the dangers involved in the confusion of one method with another. Although both Baur (1980) and Philipov (1981) refer to early and later versions of Suggestopedia, neither elaborates further.

This paper presents an analysis of the changes that have been made, and provides a detailed description of three versions of Suggestopedia referred to in the literature — Superlearning and SALT, both North American adaptations, and Psychopädie, a European version. It isolates the elements that distinguish these versions from Lozanov's Suggestopedia, highlights individual contributions in terms of innovation, discusses these in the light of the relevant research and, finally, determines whether they constitute a beneficial contribution to Suggestopedia. The term Accelerative Learning is used to refer to all versions collectively, while individual versions are referred to by their specific names.

I. SUGGESTOPEDIA

Suggestopedia has undergone a number of changes since it was first experimentally used by Lozanov in the early 1960s. Why some changes were made is not entirely clear. Lozanov (1978) claims, for example, that research was carried out on the suitability of certain types of music, but gives no further details. Although he elaborates a little in a paper given to American researchers in 1977 (in Hinkelmann, 1986), no data is available on this research in the West.

Until recently Lozanov himself never gave a clear description of a suggestopedic class. His main publication in English *Suggestology and Outlines of Suggestopedy* (1978), based on his Ph.D. thesis published in Bulgaria seven years earlier, is poorly organised and somewhat vague when it comes to a description of what actually happens in a suggestopedic classroom. This resulted in harsh criticism by linguists such as Scovel (1979) who based their review of suggestopedic language teaching solely on this publication. Bancroft (1976) suggests that there may have been a deliberate attempt to make the method inaccessible to the West and that certain items, especially those referring to yoga, may have been removed for political reasons prior to publication. Barzakov (in Ostrander & Schroeder, 1979) confirms the notion of secrecy surrounding Suggestopedia in Bulgaria.

Confusion about the method became even more acute with the publication of *Super-*

learning (Ostrander & Schroeder, 1979). This gave an account of Lozanov's method that consisted partly of an early version which Lozanov stopped using in the 1970s, and partly of elements that were allegedly observed in classes in Bulgaria, but never officially acknowledged by Lozanov. Furthermore, the book elaborated on Lozanov's method by advocating self-study courses using audio cassettes for instruction. The result was that teachers went out to practise what they thought was Suggestopedia, often using Superlearning and Suggestopedia interchangeably as a label for their method. This was particularly true for commercial courses which will be further discussed below.

In the 1980s numerous articles appeared, particularly in Western Europe, claiming to describe Suggestopedia. However, no two articles can be found that give an identical account of the structure and content of the method. If we compare *Suggestopädie alias Superlearning - Lernen wie ein Kind* (Nuber, 1986), and *Superlearning und Suggestopädie als Superlernmethoden im Fremdsprachenunterricht*, (Brenn, 1986), for example, it becomes obvious that Nuber is describing the American adaptation called LIND, while Brenn is clearly describing Superlearning.

In order to throw some light on the confusion which still exists today, we will trace the development of Lozanov's Suggestopedia from its first official model to the latest model first described by Lozanov and Gateva in 1984. Since the changes were made largely within the phase referred to as the suggestopedic session, we will concentrate on this phase here, and give a description of the entire suggestopedic cycle with the final model below.

First Model. The first description in English of what is involved in a suggestopedic session can be found in the report of the research committee working on a project in 1965 (Lozanov, 1978, p.25):

The suggestopedic session consists of an active and a passive part. During the active part the teacher reads the unfamiliar words and phrases three times (with their Bulgarian translation), using a special kind of intonation. The students listen intently, following the words and phrases on a printed program. During the passive part the students relax in a 'passive' state of distraction without concentrating their attention on anything in particular. The words and phrases are read again with special intonation by the teacher.

The special intonation referred to means that a word or short phrase was presented three times, first in a normal speaking voice, secondly in a soft voice and thirdly in a loud voice. At what stage the translation was given is not clear from this account, nor is it mentioned at any other stage in the book. Ostrander and Schroeder (1979) report that it was given first, before the intoned target language material.

When exactly music was introduced to the programme is also not entirely clear. Lozanov (1978, p.268) speaking of the "numerous experimental variants" of the suggestopedic session, mentions that "In the beginning the passive part was accompanied by pre-classical or classical music playing in the background." The passive part was therefore termed the concert session. The active part was not accompanied by music at this stage, but emphasis was given to a dramatic performance of the materials by the teacher using gestures, mimicry, body language, voice intonation — in short, all possible artistic means available. During this part, students were completely alert, following either their text or the teacher's performance or both. Before the passive part students were given relaxation exercises.

Which form the relaxation took is also vague in Lozanov's (1978) own account. The only concrete reference to be found is: "With this variant (the concert session) students used to be trained in muscle relaxation." (p.268) Presumably this relaxation took the form of yoga exercises and breathing which would explain why later versions such as Superlearning put such a heavy emphasis on rhythmical breathing. Ostrander and Schroeder (1979) report that at this stage students were trained in relaxation techniques for four days before beginning a suggestopedic course.

Second Model. In the early 1970s specific relaxation was no longer regarded as necessary since, according to Lozanov (1978, p.268), the state of pseudo-passivity achieved in the concert part of the session was "sufficient for attaining concentrative psychorelaxation even without resorting to exercises in muscle relaxation and rhythmical breathing." We do not know the reasons for this change.

Music gained more prominence in the mid 1970s. The concert session now included two parts, an active concert in which materials were presented with music of the classical period, and a passive concert with pieces from the baroque period. During the active concert, materials were still presented in the lively fashion described above; during the passive concert materials were read more quietly. Although Lozanov (1978) includes a list of music, he gives no specific instructions as to how the pieces are to be used. Ostrander and Schroeder (1979, p.83) report that, for the passive concerts, only slow movements of the baroque period were used. They were strung together to create an half hour concert and usually finished with a faster movement to allow students to come out of the reverie state in a pleasant way.

Three level intonation was still used for presenting materials in the passive concert, but the voice level was changed with each new word or phrase and repetition disappeared. For example, instead of presenting "Guten Tag" three times, it was now only presented once in a soft speaking voice, then the next phrase "Wie geht's" was presented in a normal voice and "Danke gut" in a loud voice (see Baur 1980 and Jänicke, 1982). While Jänicke's account suggests that translations were no longer given, Baur reports that translations were given "softly and neutrally" before the special intonation of each phrase which supports Ostrander and Schroeder's claim (Baur may, however, be referring to the Russian model).

Third Model. By the late 1970s the three level intonation as practised above had been dropped (Schmid, 1978). The reason for this remains unclear. Lozanov's (1978, p.269) explanation leads one to believe that he may have wanted to avoid a comparison with hypnosis. Baur (1980) points out that the only criterion for breaking up the text into segments for presentation was that a certain number of syllables was not to be exceeded and therefore little consideration to the natural syntax and semantics was given in the unnatural intonation of language segments.. He speculates that the change towards a more natural reading of the materials may have been the result of trying to rectify this problem. During the active concert the music now guides the reading in terms of rhythm and volume. During the passive concert the material is presented in its natural structure of intonation.

Lozanov and Gateva (1984,1988) also specify that entire musical pieces should be used now, which supports Ostrander and Schroeder's claim that pieces were used only in parts before. Again no specific reasons for the change are given by Lozanov. Gassner-Roberts (1988) speculates that the inclusion of all movements of a classical or baroque piece with its distinctly different tempi substitutes for the three level intonation, by raising and lowering the students' activation level in a more natural way. The full suggestopedic cycle, in its latest Lozanov version, has the following structure.

Structure of the full suggestopedic cycle

1. Preparation

No specific relaxation exercises are given to prepare students for the class. Preparation is related to the setup of the room and to giving students information about what to expect in the course of the teaching. The behaviour of the teacher suggests at this stage, as well as throughout the course, that learning will be enjoyable and easier than students may have thought. Emphasis is given to making students comfortable and confident in their abilities. The room is well lit and airy, equipped with comfortable chairs and decorated with posters containing elaborations of the material to be taught. This material is not referred to at the beginning of the course, serving simply as a peripheral stimulus. In language teaching the posters might contain conjugation tables or pronouns, or other explanations of grammar. The posters are richly illustrated using many colours and designs. Before teaching starts, students choose new identities from the target culture.

2. Presentation

During this session the materials for the first cycle are handed out to the students. (In the early version students did not have materials at this time — Schmid, 1978, Baur, 1982). For language teaching they are usually organised in dialogue form, with some explanations of vocabulary and grammar. However, other materials, such as prose texts, songs, poems or grammar, are also presented from time to time. The target language text is given on the left with the translation on the right. Materials are clearly laid out with wide margins so that texts can be followed easily by the students. If a textbook is used then the translations are given on loose sheets attached to the right hand pages of the book. Lozanov and Gateva's (1984,1988) Italian course, for example, gives the Bulgarian translations on loose strips of paper corresponding line by line with the text in the target language.

The first part of this session is called the introduction or decoding. Here the teacher introduces the text to the students using gestures, mimicry and body language, describing characters and settings in the story.

Students may repeat the text aloud if they wish but they are not encouraged to read as a group. The text is treated globally; at this stage; little detailed information about separate items is given. Students are able to understand the text immediately by glancing at the translations which reduces anxiety about handling rather large chunks of materials. These may consist of 300 to 700 lexical items in one sitting in the first session of an intensive course of 3.5 hours duration and up to 300 in the sessions that follow the completion of the first cycle. The teacher's gestures further reinforce understanding, and help with memorisation.

After the entire text has been introduced, the concert session follows. The method book which accompanies Lozanov and Gateva's (1984, 1988) Italian course contains detailed instructions of how materials should be presented during the active and passive concert.

The Active Concert. The room is well lit. The students sit calmly in their chairs. They have their texts in front of them. The teacher who is standing reads the text in the target language while an entire piece of classical music is playing in the background. The music is taken from the Vienna Classical period and from the standard romantic repertoire, and is rich in harmony and melody. The teacher calmly waits until the introductory part of the musical piece is finished and then begins the reading, adapting voice modulation and volume according to the rhythms and phrasing of the music. The voice virtually acts as an additional instrument of the orchestra, underlining the musical phrase. Especially important lexical items may be marked by a distinct change in intonation. The teacher looks at the students frequently and uses gestures to illustrate the text. The teacher's diction is clear and each word distinctly shaped phonetically. The students follow the text, glancing at the translations during breaks in the music, at which time the teacher does not read. At the end of the active concert there is a short break when students may get up and stretch, but not talk.

The Passive Concert. The room remains well lit. The students are again calmly seated in their chairs. The teacher, too, is now seated. The students have no texts to refer to. The music is taken from the preclassical (baroque) period. The character of the music is such that it creates an atmosphere of contemplation and introspection and a removal from everyday problems and conflicts. Only the materials which have been decoded and presented in the active concert are read here; no new materials may be introduced. The teacher waits until the music has begun to captivate the audience before the reading begins. The speed now is that of everyday speech with clear diction. There are no unnatural pauses during the reading. When reading a dialogue the voice is slightly changed to indicate a change in character. The students may choose whether they want to direct their attention towards the music or the reading. When the text is finished, the teacher waits for the musical piece to end, then quietly gets up and immediately leaves the room. The quiet atmosphere at the end of this session prevails. The passive concert always ends the lesson for the day.

3. Review and Elaboration

The first revision of the materials takes place on the next day. However, students are encouraged to read the text again before going to bed and on waking. It is emphasised that they should not learn the text but simply glance through it. Lozanov stresses that the material must be read on the next day or at least within 48 hours after the passive concert. He also stresses that materials must not be practised between the two concerts or immediately after the passive concert. Practice takes place during the review and elaboration sessions in the form of creative communicative exercises. These may include sketches, songs and games. Emphasis is put on meaningful communication. First, however, materials are simply re-read without elaborations. The text is then gradually expanded in terms of vocabulary and/or grammar. The review and elaboration session is usually about twice as long as the previous sessions, and may be extended until the material is believed to have been assimilated. (This may take an entire week if 700 lexical items have been presented). When this stage is reached, the cycle starts anew.

According to Lozanov (1978) a first suggestopedic language course is taught over 24 days with four 45 minute sessions daily. It can also be taught over 10 days over the same total number of teaching hours. Approximately 2000 lexical items are presented during such a course. Lozanov does not specifically recommend any distribution for teaching and claims that the suggestopedic cycle can be tailored to normal school or university time tables if block teaching is not possible, without any loss in effectiveness. (Lozanov, 1978, p.321)

II. ADAPTATIONS OF THE LOZANOV MODEL

While the above represents Lozanov's latest version of Suggestopedia, several adaptations retaining the same name exist throughout Western and Eastern Europe, most notably the Russian model (see Baur, 1980) and the version practised in the German Democratic Republic (GDR). The GDR model is particularly interesting since changes that were made to Lozanov's model were the result of published research findings. Research was carried out at the Institute for

Mnemology at the Karl Marx University in Leipzig. The music research, to some of which we have access, led to a different selection of musical pieces for the concert session. The choice of music was arrived at by measuring psycho-physiological responses to certain types of music with the use of polarity profiles completed by the students (Lehmann, 1982). The music recommended as a result of this research consists mainly of slow movements of orchestral works by Mozart and Haydn which are strung together to form one piece. Baroque pieces are no longer part of the repertoire. The concert session may start with an introductory adagio, and it always ends with an allegro. The same collection of music (Lehmann & Gassner-Roberts, 1988) may be used in every concert session.

According to Gassner-Roberts (1988a, p.3) in the GDR model the active and passive concerts have been combined into one musical séance. Three level intonation (normal, whisper, loud) is still used. Students have their text in front of them, accompanied by a full translation at the beginning and a partial translation later in the course. The teacher waits until the end of the first adagio in order to give students time to 'tune in' to the music before beginning to read a page or a specific section of the text with the next adagio. The students follow their text with their eyes. At the end of that section the teacher says "Eyes closed" and re-reads the same text while the music continues. At the end of this the teacher says "Eyes open" and reads the next section which is then repeated with the students' eyes closed as before. This cycle continues until all the material has been presented. The teacher then says, "You have learned ... lexical items in the séances so far". After waiting for the end of the last adagio, the teacher turns on the allegro and the students open their eyes. They leave the room at the end of the music.

Gassner-Roberts (1988a) further reports that while she has experimented with several versions of the concert session over a number of years in the teaching of German to university students, the GDR version was most readily accepted by the students. Although everyone had liked the passive concerts before, the active concerts were sometimes rejected by the students as being artificial and strange. Furthermore, some students, particularly those interested in music, found themselves analysing the different musical pieces presented during the concert session. In the GDR version the students hear the same music throughout the course which means that they become familiar with it and therefore no longer focus special attention on it.

III. SUPERLEARNING

To describe Superlearning accurately as a method is not easy. There are problems in organising the material since Superlearning is often used simply as a synonym for either Suggestopedia or SALT or for a combination of both. Hinkelmann (1986) deplores the fact that the only attempt made at a distinction between the two is the labelling of Superlearning as the commercial product of the more scientifically valid and serious Suggestopedia. While this distinction may hold true when comparing Superlearning courses which boldly advertise their product with the help of unsubstantiated claims (such as those pointed out by Gassner-Roberts, 1987 and Schiffler, 1987), this is not always the case with well researched Superlearning courses. Undoubtedly there are good and bad examples of all versions of Accelerative Learning. The concern in this paper is not to compare the different versions in terms of their efficacy, but to identify distinguishing features between each version in order to clarify what has so far been a confused situation for users and researchers alike.

The term Superlearning was introduced by two American researchers (Ostrander & Schroeder, 1979). They define it thus:

> Superlearning ... refers to an eclectic system for accelerated learning of factual data resulting from westernized, modernized techniques for developing supermemory. Superlearning is also used generally to refer to all the learning systems that work holistically to develop reserves of mind and body. (p.24)
>
> We've used the same background sources Lozanov drew from (such as Raja Yoga) and also others he does not mention. We've drawn from Lozanov's own highly creative work. Finally, we've tried to draw from the

experience of those who've gotten rapid-learning results in North America. (p.69)

This definition suggests that Superlearning was designed using some elements of Suggestopedia and some elements of the American version which became SALT. Superlearning differs from Lozanov's Suggestopedia in several ways, notably its use of relaxation and synchronisation, and its focus on self-instruction.

Relaxation. Although Ostrander and Schroeder knew that Lozanov had dropped specific relaxation from his programme, they were in agreement with the Western rationale for retaining relaxation and for using special visualisation techniques, and therefore included both in Superlearning. Since these elements were introduced by the American researchers responsible for SALT, they will be discussed below.

Synchronisation. Following Bancroft's (1976) observations, Ostrander and Schroeder (1979) interpreted Lozanov's method as including synchronisation of the students' breathing and the presentation of materials.

There is no evidence of this in any of Lozanov's publications, yet Bancroft (1976) felt that this was the vital element withheld from explanations about the method when visiting Bulgaria.

It is possible that Bancroft observed classes during the period when Lozanov was experimenting with presenting materials at different intervals. Jänicke (1982) and Baur (1980) report such experiments. Apparently Lozanov experimented with presenting words via tape recordings in one second, five second and ten second intervals and found significant differences in retention rate. Reports of the magnitude of these differences vary, however. Ostrander and Schroeder (1979) report that in the one second condition students learnt about 20% of the words, in the five second condition 30%, and in the ten second condition 40%, while Baur (1980) writes that the ten second condition increased retention rate by 10% when compared to the other two. Jänicke (1982) reports that twice as many words were retained in the five second condition and three times as many in the ten second condition when compared to the control groups. Ostrander & Schroeder, and

Baur do not mention control groups; it is therefore possible that either different experiments were quoted or that the one second condition functioned as the control. Only Baur gives an exact source for the study, Lozanov's *Suggestologija*, (1971, p.244), which is not officially available in English. This is just a small example of the inconsistency of reports about research on Suggestopedia. More detailed information is discussed in Felix (1989).

On the basis of Bancroft's observations in Bulgaria, Ostrander and Schroeder (1979, p.115) placed a great deal of importance on correct rhythmical presentation of materials in Superlearning. They suggest the following cycle for the presentation of materials and the students' breathing: "All the materials spoken are precisely timed on an 8-second cycle so breathing will naturally fall into a rhythmic pattern of: hold 4; out 2; in 2." This means that the material to be learnt is presented in small chunks during the four seconds in which the students hold their breath.

Students are extensively coached in the correct breathing procedure and encouraged to practise several cadences of this breathing before a concert session. Ostrander and Schroeder point out that some students, especially children, have difficulties learning or sustaining the rhythmical breathing; they suggest therefore that taped material could contain a metronome tick to aid with timing. It is not clear why materials are presented in an eight second cycle. Ostrander and Schroeder claim that this was the precise cycle observed by Bancroft in Bulgaria. However, if Lozanov had found the best results with presenting words every ten seconds, why would he have used a rhythm in which words are presented every four seconds? Bancroft (1978a) speculates that he may have switched to this presentation because of the rhythms of the baroque music, but does not give any further explanation.

Research on synchronisation is minimal and does not consistently show that it is beneficial to the students' learning. Bordon and Schuster (1976) found a significantly positive effect on retention of vocabulary, while Renigers (1981) speculates in his conclusions that the students' efforts to concentrate on synchronisation may have hampered their relaxation and consequently their performance. For similar reasons almost all practitioners have now dropped synchronisation from their programmes. Renigers' (1981) speculations are supported by Fassihiyan (1981) who reports unfavourable results in Iranian experiments based on yoga exercises and rhythmic breathing when comparing these to experiments based on music in Canada (Racle, 1975). Ostrander and Schroeder (1979) give Shaffer (1979) as one of their sources for the efficacy of breathing techniques in Superlearning. Shaffer claims that the yoga breathing techniques are the most responsible for rapid learning. She asserts that Lozanov himself was "totally unaware of the key mechanisms responsible for accelerated learning in his method" (p.180) and offers the following scientific explanation of the 'Lozanov Effect':

> It is asserted that the Lozanov effect achieves memory and learning enhancement by lowering the carbon dioxide concentration of the blood through voluntary hyperventilation, thereby raising the pH level of the

body fluids and thus increasing the excitability of the nerve cells. In this way, it is maintained, learning and memory consolidation occur faster than by ordinary means. (p.180).

No empirical evidence of how this effect is achieved in Suggestopedia or Superlearning is given. The assertion that breathing is the single most important element in improved learning is strongly refuted by the fact that the majority of studies which report such improvement (see Felix, 1989) do not use synchronised breathing.

Self-instruction. Superlearning is presented as a self-study procedure where materials can be prepared on audio tapes. This is the greatest element of distinction between Lozanov's Suggestopedia and Superlearning. Three very important aspects of Suggestopedia are ignored: the vital role of the teacher, the extensive review and elaboration periods, and group dynamics. In Superlearning, students are told that all they need is a tape recording and a set of instructions in order to accelerate their learning by astounding rates. The focal part of the method is the supermemory session, which corresponds to the first model of the suggestopedic session described above. The decoding and activation of the materials are left to the students themselves. The passive state of the student is promoted while the active state is largely ignored. Emphasis is given to lowering body rhythms through relaxation and breathing, yet little consideration is given to the fact that, especially in language learning, students need to engage in meaningful communication in order to assimilate the materials given in the concert sessions in terms of functional use.

Structure of Superlearning

The following is the structure of a Superlearning programme, as described by Ostrander and Schroeder (1979).

1. Preparation

In order to prepare for the supermemory session, students are encouraged to practise relaxation, either in the form of Jacobson's (1938) progressive relaxation exercises or through visualisation. Many examples are given. They are further instructed to practise the correct breathing procedure and to give themselves affirmations such as "Learning and remembering are easy for me."

2. Presentation

Before beginning the supermemory session, students are instructed to 'review' the materials they wish to learn as vividly as possible. It is suggested that they try to do this in the form of a game, a play or a dialogue. It is difficult to work out how this is done when the materials are completely unknown to the students, but no further suggestions are given.

The supermemory session follows. In the first part, students are instructed to read silently through the materials while the materials are recited either by a person present or on tape (extensive instructions are given for the preparation of tapes). In the second part, students are asked to close their eyes and listen to the materials again, this time with the slow baroque movements playing in the background. In contrast to Lozanov's instructions above, students are told to pay attention to what is being said, to breathe in synchronisation with the presentation of the materials, and to visualise the materials. The combination of attention on three complex processes is far removed from Lozanov's original intentions of 'concert pseudo-passivity'. How effective imagery would be in this context, when students are already concentrating on their breathing, is also questionable. Schuster and Wardel (1978) found that imagery as a variable of instruction for vocabulary learning was very effective on its own, but marginally less effective when coupled with other variables.

3. Review and Elaboration

This is the part that is conspicuously missing from Superlearning. Students are simply instructed to give themselves a quiz after the supermemory session, and to 'use' the materials they have studied within the next few days.

From the point of view of language learning Superlearning in this form has more in common with audio-lingual courses than with Suggestopedia. The addition of music, relaxation and imagery may produce a more efficient and enjoyable audio-lingual course, although no comparative studies are known to this author. The addition of synchronised breathing, however, may hamper students' learning. Superlearning in this form cannot be compared to Suggestopedia which can in essence be described as creative communicative teaching with the addition of music and suggestion.

Linguists have made various criticisms of Superlearning. In particular, Baur (1984, p.292) criticises it for (1) concentrating on the learning of vocabulary and/or idiomatic phrases, and ignoring the productive/creative and practical aspects of language, (2) for testing competence through translation of single words, leaving unclear just what language skills have been mastered, and (3) for suggesting that relaxation allows the passive acquisition of language skills, while ignoring the need for active communication.

While Baur's criticism is valid for Superlearning as described above, it does not hold true for Suggestopedia, although some linguists (Scovel, 1979, Brown, 1987) appear not to distinguish between the two. Scovel (1979, p.260), reviewing Lozanov's *Suggestology and Outlines of Suggestopedy,* believes that "suggestopedy ...is an attempt to teach memorisation techniques and is not devoted to the far more comprehensive enterprise of language acquisition". Given the nature of Lozanov's presentation of Suggestopedia in this book, it is not surprising that Scovel came to this conclusion. Lozanov does speak predominantly of hypermnesia, and he does not describe in detail the entire suggestopedic cycle which includes the extensive review and elaboration session described above. Lozanov is not a linguist, and in this publication he was concerned with the effect of suggestion as related to hypermnesia. To make a valid criticism of Suggestopedia in language teaching, it is more appropriate to look at courses designed by linguists. The Lozanov cycle described above was designed in collaboration with Novakov and Gateva, both notable linguists, and includes elements that address the complexities of language learning, long before the advent of Communicative Teaching and the Natural Approach which are generally well received by linguists and with which Suggestopedia has much in common.

Following the publication of Superlearning, two things happened. Teachers began using Superlearning in the classroom, and commercial courses, largely following the structure above, were offered. For the former, the model had to be expanded and tended to include Lozanov's review and elaboration sessions. In this form, the method became a combination of Suggestopedia, Superlearning and SALT. A typical example of this is Dröbner (1986). From now on labels were used virtually at random, and if the treatment in experimental studies was not described in detail, it was impossible to know which elements had been included. As a consequence, Suggestopedia was sometimes judged by courses which had little in common with Lozanov's model.

The appearance of high profile commercial Superlearning courses contributed to the confusion. Furthermore, many courses of this nature use sensationalist research reports for advertising, such as the claim that language learning can be increased 50 times and more. This claim Lozanov himself never made, but is attributed to him as a consequence of the confusion. Sound scientific data on Accelerative Learning which disputes such claims has become available. This practice did not enhance the credibility of Suggestopedia in the eyes of applied linguists. These courses are generally self-study courses produced on cassettes accompanied by a textbook. They enjoy varying degrees of success depending on how well they are designed and produced. While some courses are very poor in terms of content and structure, there are also some good ones.

An example of the latter is a course produced by a psychologist and a linguist in West Germany (Kelly & Hinkelmann, 1986). An attempt has been made to include the entire suggestopedic cycle, synchronisation has been dropped and students' arousal level is monitored by alternating active and passive states guided by the appropriate musical backing. Materials are organised in dialogue form, with vocabulary lists and exercises following every paper. A brief grammatical overview and a small dictionary for travelling purposes are also provided in the textbook. Students are informed about the nature of Superlearning in the introduction. It is suggested that students will learn in a relaxed atmosphere in which learning blocks are impossible. The term Superlearning is used as a synonym for both Suggestopedia and SALT. The course has the following structure.

Structure of Commercial Superlearning

1. Preparation

An audio cassette with relaxation exercises is provided. These range from systematic muscle relaxation to visualisation exercises such as mind-calming described below in the SALT section. They are accompanied by music such as the second movement from Beethoven's Emperor Concerto and Pachelbel's Canon, finishing with a short piece of the faster third movement from the Emperor Concerto accompanied by wake-up suggestions.

2. Presentation

Materials are presented in two concert sessions. For the first concert the students are instructed to remain relaxed, but to follow the text in their book. No translations are given during the reading and the target language is read rather slowly. This session is accompanied by the slow movement of Beethoven's Pastoral Symphony. Before the next session begins the visualisation exercise given on the preparation tape is repeated.

For the second concert students are instructed to remain completely passive and to enjoy the simultaneous presentation of music and language as if they were at a concert or at the opera. This session is accompanied by Bach's Airia in G, and the reading this time includes the translation of the materials which are now presented in short phrases and at normal speed. This session finishes with the same piece of music and wake-up suggestions that were given at the end of the preparation tape. In an accompanying brochure the suggestion is given that during these learning concerts a passive knowledge of the materials is acquired (Hinkelmann 1988, p.6).

3. Review and Elaboration

The students are now encouraged to practise these materials in a communicative fashion, presumably with a partner, in order to activate the materials. The accompanying brochure emphasises the importance of this activity. A variety of language games are provided for this purpose.

The designers of this course have attempted to include a more substantial activation period of the materials than was suggested by Ostrander and Schroeder (1979). How effective these practice sessions are, however, when students are left to their own devices, cannot be ascertained. Although this course may well be more effective and more interesting than a traditional audio-lingual course, it is far removed from Lozanov's Suggestopedia. The main difference between the two is still the physical presence of the teacher in Suggestopedia. It is the teacher who provides the suggestive atmosphere, creates positive group dynamics, guides the direction of the elaboration exercises and provides constant positive feedback. And even if students were able to conduct their own review and elaboration periods adequately, the cassette course still lacks the coherence of the Lozanov cycle and the positive reinforcement that is gained by the students witnessing each other's progress.

The main difference between Suggestopedia and Superlearning when used in the classroom is the latter's use of relaxation and visualisation exercises, and the inclusion of synchronisation of students' breathing with the presentation of materials. It does not appear from the research that synchronisation is a beneficial addition to Suggestopedia, which is reflected in the fact that most practitioners of Superlearning and SALT have excluded this element from their teaching. The claimed benefits of visualisation will be discussed in the SALT section below.

IV. SUGGESTIVE ACCELERATIVE LEARNING AND TEACHING (SALT)

This version of Suggestopedia was developed by a group of American teachers and college professors (Schuster, Benitez-Bordon & Gritton, 1976, Schuster & Gritton 1986). Their first version in the mid 1970s followed essentially Lozanov's second model, but retained yoga breathing and exercises, and, following Bancroft's (1976) suggestions, included synchronised breathing during the concert sessions. The Americans believed that specific relaxation was beneficial to students in the Western world, especially in the school environment where students can be hyperactive, badly disciplined and lacking in concentration. While Lozanov (1978) claimed that in Suggestopedia relaxation is naturally produced in the concert sessions and therefore does not need special attention, the Americans reintroduced relaxation, both physical and mental. They believed that the cultural differences between Bulgaria and America (pointed out at length by Barzakov, 1982 and Bayuk, 1983) were such that Lozanov's model needed to be adapted for American conditions. This adaptation was mainly reflected in the introduction of relaxation and visualisation techniques.

In their second version, therefore, the Americans favoured a technique called mind-calming over yoga breathing and exercises, although some practitioners (Held, 1978) used both. Synchronisation was eventually dropped by most practitioners, but not by all. The reasons for dropping synchronisation were largely the same as those mentioned above. Prichard and Taylor (1976), for example, report that some learning disabled children had difficulties relaxing while concentrating on the synchronised breathing.

Mind-calming consists essentially of visualisation exercises related or unrelated to the subject taught. Its purpose is to focus the students' concentration and attention on the task, to create a positive learning environment and to clear students' minds of all irrelevant information to do with their personal lives (Schuster, 1976). Stricherz (1979) who compared the effectiveness of several physical and mental relaxation techniques, reports that the technique similar to mind-calming as described here "affected blood pressure the least, but provided the greatest self-reported sense of relaxation and well-being". (p.189) This suggests that although physical relaxation may be more effective on a physiological basis, mind-calming may produce greater psychological effects.

How visualisation can be used to affect the psychological state of the students is extensively outlined in Schuster and Gritton (1985). Nervous or hyperactive students might be calmed through a "walk in the forest", tired students given new energy through "soaking up the sun on the beach" and negative students made more cheerful and positive through recalling a positive learning experience from their past.

Schuster (1976) describes this last technique of restimulation as a Gestalt procedure which involves not only visualisation, but also the students' emotions. He claims that this element alone may be effective in increased learning in SALT, but gives no further details. He may be referring to early experiments such as Gritton and Benitez-Bordon (1976) who taught mathematics, science and spelling to school children in large classes using restimulation and other forms of mind-calming only. Since there was no control group, Gritton and Benitez-Bordon (1976) report the results on a naturalistic basis: students worked better, were more interested in the subject, were more confident and had fewer discipline problems.

Mind-calming can also be used for subject specific activities. Herr (1981) suggests an interesting visualisation technique related to language learning. Here the students are encouraged to imagine themselves in the environment of the language they are studying, hearing the sounds, seeing the language written on signs, literally experiencing the language. With some imagination this could be transferred to other subjects. Similar techniques have been successfully demonstrated by Swart (1987) in the teaching of a Shakespeare text.

Visualisation during mind-calming can also be used for goal oriented purposes, such as students seeing themselves as having successfully completed the course, or at various successful stages along the course. It can further be used to reduce anxiety before tests by students calmly completing the test in their imagination. These techniques are extensively used in sports psychology. Setterlind, Uneståhl and Kaill (1986) developed a systematic relaxation training for youth, based on visualisation of this kind which was introduced to all Swedish schools. The approach is more fully discussed in Felix (1989).

Experimental research on the effects of mind-calming in education is not extensive, but suggests a positive effect on learning and behaviour. Stricherz and Stein (1980) investigated the effect of four different relaxation techniques on students' ability to recognise words which had been presented audio-visually after induction to the different conditions. 112 adult students were the subjects in this well-controlled experiment. The results showed a significant difference in the number of words recognised favouring the cognitive mind expansion procedure (similar to mind-calming) over the control group. No significant differences were found between any of the other conditions.

Galyean (1980) investigated the effect of guided imagery activity on various behaviours of low achieving students at a minority school in Los Angeles. Three independent observers recorded various positive and negative behaviours of students in two Spanish classes taught by the same teacher. Treatment in the experimental class consisted of visualisation sessions lasting five to seven minutes at the beginning of each class. Students were encouraged to a) focus on their inner strength, b) view themselves as potentially successful learners, and c) view the teacher and the others as helpers in their quest for success. Results after three months and 12 observations showed significantly fewer occurrences of negative and disruptive behaviour in the experimental class. It must be pointed out, however, that subjects were not assigned at random, and that the behavioral compatibility of the two classes was not checked before the introduction of the treatment. While Galyean herself realised these limitations, she was satisfied with the classes' compatibility on the basis of teacher reports prior to the experiment.

The positive effect of visualisation in the learning environment has further been shown by Kosslyn (1980,1983) and its powerful use in verbal learning by Paivio (1971). Although in SALT visualisation is widely used for mnemonic purposes as in Paivio and Desrochers (1979), the range of uses is enormous and only limited by the expertise, enthusiasm and imagination of the teacher and the students. The SALT version described by Schuster and Gritton (1985) has the following structure.

Structure of SALT

1. Preparation

This session starts with simple physical relaxation and stretching exercises followed by mind-calming exercises. The visualisation during the latter often takes the form of recalling a pleasant learning experience in the past. The session may include positive learning suggestions related to the ease of learning or to goal setting.

2. Presentation

This session is almost the same as that in Lozanov's third model. It begins with a review of previously learnt material, followed by a preview of the material to be studied. The two concert sessions, using Lozanov's early music suggestions, namely classical pieces for the active concert and slow baroque movements for the passive concert, conclude this session.

3. Review and Elaboration

This session follows to a large extent the format suggested by Lozanov's cycle above, but it may include self-corrected quizzes and a mind-calming session at the end of the class.

While this is the predominant version of SALT, there are slightly altered versions within SALT. Some practitioners insert a mind-calming session immediately before the concert sessions and others practise the material between concert sessions.

SALT appears to be a sensible adaptation of Suggestopedia in the Western world. The chief difference between the two approaches is the retention of physical relaxation in the former and the inclusion of mind-calming for mental relaxation during the preparation session. Although research on the effects of mind-calming is limited, there is some indication of its benefits in terms of positively affecting the psychological state of the students as well as improving students' performance in recognition tasks. Mind-calming may therefore well be a valuable contribution to Suggestopedia which is reflected in the fact that it has been adopted by many practitioners of other versions of Accelerative Learning around the world.

V. PSYCHOPÄDIE

This version of Suggestopedia was developed in West Germany by Baur (1984) who looked at the method as an applied linguist. While previous versions had been used for teaching various subjects, Psychopädie was specifically designed for language teaching.

Baur rejects the long periods of purely receptive states in which students taught with Superlearning, SALT and Suggestopedia find themselves. He believes, in sharp contrast to Krashen (1982), that language learning has to be an active process right from the start. With suggestopedic teaching students may remain passive for the entire first day of an intensive language course, which would correspond to Krashen's (1982) 'silent period'. Baur has his students reproducing materials after the first twenty minutes. He argues that if active periods are included in the presentation sessions, students will find the transition to the activation periods more natural. He further points out that during the long passive periods, rational-analytical learning strategies may be activated which could hinder communication considerably (Baur 1984, p.295).

While these observations may be justified from a linguistic point of view, some of Baur's criticisms of Suggestopedia seem surprising, in particular, that it does not take into account important non-verbal elements of language acquisition, but is exclusively conducted through listening, reading and musical-emotional backing (Baur, 1984, p.294). Baur speaks of the students' *Wahrnehmung* [perception] rather than of the production of language items. Even though the students in Suggestopedia remain physically passive during the presentation stages, they do not exclusively perceive and receive the language via reading and listening. Lozanov (1978) makes it abundantly clear that communication takes place on more than one level, namely verbal and non-verbal, and that the teacher needs to use every possible device, such as mimicry and gestures, in order to make materials more accessible to the students. Baur's criticism, therefore, is more appropriate to the Superlearning courses produced on cassettes where such elements cannot be included.

Baur is, however, justified in claiming that the students are not physically involved in what he terms *Gestik* during the long receptive periods in intensive suggestopedic courses. He not only believes that the students need to practise the materials earlier than Lozanov suggests, but that they also need to reproduce the non-verbal elements included in the presentation of the materials. He emphasises (Baur & Grzybek, 1984, p.70) that the term *Gestik* has to be broad since gestures are inevitably linked with other non-verbal and/or paraverbal communication. In order to investigate the efficacy of *Gestik* in the suggestopedic presentation phases, Baur and Grzybek (1984) carried out a study in which 60 lexical items of Russian were presented to 203 volunteer adult students who knew no Russian. The presentation phases were largely based on Lozanov's first model:

1. First decoding (bilingual text), with the help of mimicry, gestures and movements.
2. Second decoding as above, but students imitate words and non-verbal elements.
3. Intoned reading of the material (neutral, loud,whispering), without music.
4. Musical séance — materials read to the playing of baroque music.

Presentation of materials took place in the following three different conditions:

1. Teacher presented materials with *Gestik* during the first phase. Students reproduced materials with *Gestik* during the second phase.
2. Teacher presented materials with *Gestik* during the first phase. Students repeated materials verbally without *Gestik* during the second phase.
3. Teacher presented materials audiovisually. Students repeated materials verbally.

Phases three and four of the presentation cycle remained as above and were identical for all groups. Subjects were given a 20 item multiple choice test immediately after the sessions, and one week later. Students did not know that they were going to be retested. Baur and Grzybek were particularly interested in the results after one week since items had to be recalled from long-term memory. The results showed (1) an increase in retention rate after one week in the first condition, (2) an unchanged retention rate after one week in the second condition, and (3) a decrease in retention rate after one week in the third condition. These trends were highly significant for all within-group tests. Between groups the difference between the first and second conditions, as well as between the second and third conditions was significant. The difference between the first and third conditions was highly significant.

In order to integrate these findings and to provide a more balanced model in terms of the alternation of active and passive states in Suggestopedia, Baur (1984) developed the following structure for his Psychopädie cycle (information about the distribution of time for the individual phases in this intensive language course is included):

Structure of Psychopädie

1. Preparation

Before the course begins students are informed about the nature of the course and introduced to the relaxation techniques used. Baur does not specify the time involved.

2. Presentation

Introduction Phase. The first 20 minutes of the course are spent decoding the new materials in a lively manner integrating non-verbal elements to bring the text alive. This part is identical to the beginning of Lozanov's presentation session, although the short duration suggests that fewer lexical items are introduced here. Baur (1984, p.309) stresses that the role of the teacher's use of *Kinesik, Gestik* and *Mimik* is not to convey the meaning of the text, since its translation is given, but to activate the interest of the learner and to superimpose on the text characteristics which are perceived via a multitude of channels and are stored as secondary associations which aids in the retention of the materials.

Reproduction Phase. The next 90 minutes are spent with active reproduction of the text by the students through interactive exercises. This phase does not exist in this position in any other model of Accelerative Learning; the exercises described here, such as role play and introductions, are part of the review and elaboration sessions in all the above models. Baur can therefore be seen as distributing the activities for review and elaboration over two sessions. In this session the learners are made familiar with the text so that items used in the activation session are easily recognised. They are given the opportunity to develop their playful creative fantasy, to lose their fear of speaking, to realise that it can be fun to operate in the target language, and with the integration of physical activities overcome their passive involvement in the learning process.

Analytical Phase. This 40 minute session is largely based on the second model of Lozanov's active concert session. Baur (1984, p.313) points out that here the cognitive-analytical abilities of the learners are activated through the reading of the text, the recognition of word and syllable divisions, the comparison of mother tongue and target language structures, and the comparison of phonetics and spelling.

Associative Phase. This session of 30 minutes is largely based on the first model of Lozanov's passive concert session. Before this session the students have a relaxation period with physical exercises and visualisation exercises. The placement of a relaxation session here, although different from the models discussed above (except Lozanov's first model), is supported by some other practitioners of Accelerative Learning. Stockwell (1985), for instance, feels that students, especially in intensive courses, do not need relaxation at the beginning of the course but at this stage. Baur (1984, p.315) points out that here the logical-analytical processes of the left hemisphere, which were predominant in the phase before, give way to right hemisphere dominated processes. Now the materials are again perceived globally with the superimposition of the musical structures.

3. Activation

Baur stresses that before this session at least one night of rest should be given to consolidate the materials. The next four to six hours are spent with the activation of materials in playful communicative situations. Emphasis is put on the development of spontaneous speaking, although writing skills and grammar are also included. Baur (1984, p.319) believes that because materials were already presented in a playful fashion during the reproduction phase, the transfer from input to activation and functional use is more natural than in Suggestopedia.

Psychopädie appears to be a well designed adaptation of Suggestopedia for intensive language teaching. Baur, too, points out that his model can be adapted for different learning environments, provided that the relationship of time and phases is held constant. The main difference between this model and Lozanov's model is the inclusion of a reproduction phase before the concert sessions. In the Lozanov model as in Superlearning and SALT, the students remain in a receptive state right up to the review and elaboration sessions. Baur's model by contrast provides a more even alternation between receptive and active states which may well be more attractive to the students. However, the receptive phases in Suggestopedia are generally not seen as unpleasant, especially by adult students. Baur's model may also be attractive from the teachers' point of view. Intensive courses, in particular, tend to be very demanding on teachers in these prolonged "performance" sessions.

In terms of structure all Baur does is reshuffle Lozanov's model by taking some time devoted in Suggestopedia to elaboration and practice and using it for similar purposes in the presentation stages. Although Baur and Grzybek (1984) have given some empirical evidence for the efficacy of students' reproducing non-verbal elements in the presentation phase, this study on its own does not give sufficient support to the rationale of including a reproductive phase in the presentation sessions. Lozanov's and more recent researchers' use of non-verbal elements in the review and elaboration sessions, and indeed throughout the suggestopedic cycle, may well prove equally as efficient. In order to prove the superiority of a reproductive phase, it would be more appropriate to compare the results after teaching with the entire cycles of both models.

Summary

Suggestopedia has undergone a variety of changes over the two decades of its existence. Some changes, mainly those to the concert session, were made by Lozanov himself, others were made by exponents adapting the method for their own environment. The latest version of the suggestopedic cycle includes a preparation session, decoding of the materials to be learnt, an active and a passive concert session in which materials are read with the backing of entire classical or baroque pieces respectively, and extensive review and elaboration sessions.

In Eastern Europe the method differs the least from this model and it is still referred to as Suggestopedia. Researchers in the German Democratic Republic, however, have reduced the two concert sessions to one and made changes to Lozanov's music selection. Music from the baroque period which is still predominant in Lozanov's selection is no longer used in the GDR as a result of research which showed more favourable student responses for the Vienna classical period.

The two major versions of Suggestopedia in the West are Superlearning and SALT, both originating in North America. Another version developed by a linguist in West Germany is called Psychopädie. The originators of these versions have also made changes to Lozanov's Suggestopedia. The chief contribution of Superlearning is the inclusion of synchronisation of breathing and presentation of words during the passive concert session. The limited research does not consistently show this element to have a positive effect on the retention of materials. However, the literature does suggest consistently that this element may be cumbersome for the students to handle which is reflected in the fact that synchronisation has been dropped by most practitioners. Superlearning also advocated self-study courses produced on audio-tapes, a system which was adopted by commercial enterprises around the world. Although good examples of such courses exist, vital elements such as the teacher's presence, group dynamics and the communicative interaction between students cannot be included in such courses.

The most important contribution of SALT is the inclusion of mind-calming during the presentation phase. Although research, here too, is not extensive, the literature shows a positive trend towards improved learning and improved behaviour as well as other positive psychological effects being associated with mind-calming. This may therefore well be a positive addition to Suggestopedia which is reflected in the fact that most Western practitioners have adopted mind-calming in their programme.

The contribution of Psychopädie to Suggestopedia is the insertion of a reproductive phase before the concert sessions. The rationale for this was to break up the long passive states in which suggestopedic students in intensive courses find themselves. Although there is no empirical evidence as yet which supports the efficacy of such a phase, it may well be attractive to students and teachers alike to have a more balanced programme in terms of students' arousal level. Some practitioners already use this phase in their programme, most notably the GDR researchers.

Although there are distinct differences between the four versions of Accelerative Learning discussed here, caution must be exercised when interpreting research results if the treatment is not described in detail. Labels are sometimes used interchangeably, and elements generally associated with a particular version may no longer be used. This has led to some confusion about the exact content of an Accelerative Learning course. However, all four versions consistently use the same three elements — music, relaxation and suggestion. While in the West special attention is given to relaxation in the form of progressive relaxation or mind-calming either during the preparation phase or before the concert session, practitioners in the East no longer practice relaxation explicitly. According to Lozanov (1978), however, relaxation is still produced through other suggestive means, such as music, teacher behaviour and classroom atmosphere.

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La evolución de aprendizaje acelerativo de Lozanov a lo actual.-. La meta de este artículo es de echar luz en la confusión y la controversia asociada con el eprendizaje acelerativo. Un defecto importante en la literatura es que se usan nombres por las diferentes versiones de aprendizaje acelerativo intercambiamente, que se da poca atención al contento exacto del tratamiento administrado al interpretar los resultados de investigación. Este artículo provee una descripción detallada por la evolución de la estructura y contento de la versión original de sugestopedia y tres adapciones mayores, superaprendizaje, SALT y psicopedia. No se comparan estas por su eficacia relativa, pero se identifican los cambios y contribuciones hechos a la versión original y se discute el mérito de adiciones a la sugestopedia de Lozanov a la luz de resultados revelantes de investigación. Una extensa revista de la literatura reveló diferencias importantes entre versiones. La sugestopedia a su misma se cambió por lo general con respecto a las selecciones musicales en las sessiones de concerto. El superaprendizaje reintegró unos ejercicios específicos de relajación suprimidos por Lozanov y incluyó aliento sincronizado. Psicopédia incluyó una fase reproductiva antés de la sesión pasiva de concerto. Se hizo SALT la versión mas prominente en el oeste, en gran parte porque publicaciones de resultados de investigación eran mas frecuentes, y su mayor contribución, la inclusión de calmar la mente, les atrayó a los practicantes occidentales..

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Relaxation Training Effects on Anxiety and Academic Performance*

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Abstract. The study examined the relationships among state anxiety, trait anxiety, and performance. It also estimates the value of a short relaxation with music session against a lecture treatment across two subject areas. No improvement in performance was found for either treatment. However, anxiety was reduced in both conditions. The lecture condition was found to lower trait anxiety. The implications are

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discussed within the framework of learning theory and measurement.

Introduction

Various relaxation, biofeedback and other approaches have been found in the literature that aim to alter the u-curve relationship existing between arousal and performance (Hebb, 1955). Although at first glance the problem may appear simple, it is clear that in addition to examining variations in relaxation treatments, other issues remain. Both anxiety and performance need to be considered more specifically. For example, learning is "indexed" by performance measures on a variety of tasks that often involve different types of learning outcomes (Gagne, 1977), such as paired association concepts. Similarly, with respect to anxiety, several hypothetical types have been measured that vary from characterological to situational. Many types of relaxation training approaches have common elements including some components relating to muscle relaxation, regular practice of the exercises, the use of the relaxation in everyday situations, and the teaching of some method for achieving mental quieting (Render, Hall & Moon, 1984; Spielberger, 1966; 1972). Studies using cognitive modification have found that attention training to relevant cues, focalized instruction, and ignoring self-oriented internal responses, have improved the performance of anxious subjects (Meichenbaum, 1972; Wine, 1971). Systematic desensitization has been shown to be effective in reducing test anxiety (Dawley and Wenrich, 1973; Freeling and Shemberg, 1970), but in many studies improvement in test performance involves a combination of desensitization and study counseling (Allen, 1971, McMannus, 1971). Electromyograhic biofeedback has also shown some success in increasing the effectiveness of relaxation training (Haynes, Moseley, and McGowan, 1975). Schuster and Martin (1980) found that biofeedback-induced tension helped highly anxious subjects in a vocabulary learning task compared to when they were relaxed. Although relaxation training has been used to treat test anxiety little is known about autogenic relaxation training (Snider and Oetting, 1966). Schuster and Martin (1980) also investigated the effects of suggestion and other factors on learning of vocabulary words. Although the above study was clouded by low scores generally on retention and did not report the mean score for chronic anxiety subjects, suggestion was found to facilitate learning in some instances. Autogenic relaxation training exercises intended to reduce anxiety and improve performance appear promising yet a number of issues remain unaddressed. More recent studies appear also limited insofar as the nature and the assessment of the causal variable is concerned. That is, researchers often allow for the designation of subjects to experimental conditions such as chronic high, medium or low anxiety. Although approaches to the treatment of anxiety often involves complex methods and measurements, such precision is found wanting in establishing the concurrent and construct validity of anxiety measures. Many of the equivocal findings in this literature may stem from poor internal validity which is associated with current instruments' failure to distinguish among types and levels of anxiety.

The Effects of Music Brislan (1987) recognized music as "an art, science and form of therapy, in myth and legend" (p. 115). The effect of music in relationship to anxiety, relaxation, performance, and learning has been approached from a variety of directions in various studies. Perretti (1975) found music to reduce anxiety during the performance of a lab task. Perretti suggests that music decreases tension caused by conflict and frustration and may serve to coordinate the individuals' rational and emotional states. Music has been noted to both calm and stir emotional and physical arousal. Two basic categories of music have been identified: stimulative and sedative. Stimulative music is described as "enhancing bodily energy, inducing bodily action, and stimulating the emotions" while sedative music "is of a sustained melodic nature with strong rhythmic and percussive elements largely lacking (Gaston, 1951). Music has often been recommended to promote relaxation and stress management skills (Charlesworth & Nathan, 1982), but empirical research is scarce with regard to learning with few exceptions (Amend, 1989; Brislan, 1987; Carpuso et al, 1952: Render, Hull & Moon, 1984). Lowe (1973) used music to try to evoke positive excitement as a response incompatible with anxiety. In that study anxiety was preventing proper verbal responses necessary for job success and conventional counter-conditioning was found ineffective. The treatment was changed to imagining anxiety provoking scenes while listening to "exciting" music. As a result, subjects found the treatment to be successful with the excitement and imagery of proper performance effective in combating anxiety. This suggests that the use of music and relaxation may produce altered states of consciousness, which enhance creative thinking and open up the possibility of new learning and experience. Music's effect on learning has also been examined in numerous studies inspired by Lozanov's (1978) work. Portes and Foster (1986) sum up this phenomenon stating that "in brief, imagery, music and other prosaic functions of the right brain, along with all visual/auditory linear processing of the left brain facilitate learning in each of the encoding, storage and retrieval phases," p. 34. Much of the research has focused on the use of music to sedate and relax. However, stimulative music may be helpful under certain conditions requiring certain types of cognitive activity (Smith & Morris, 1976). The negative effect of this stimulation can be preoccupation or worry, but positive arousal could be seen as increased alertness and attentiveness. A curvilinear relationship between arousal and performance has been hypothesized (Hebb, 1955) yet individual differences in what is considered arousing seem to moderate the correlations reported.

The effects of music on performance may involve interactions among (types of) person and music variables. Again, the literature reflects conflicting results with a few studies showing no effect, while others show positive effects of soothing background music on performance. Stanton (1973) reported that using classical music during tests helped highly anxious students achieve superior results in performance. Smith and Morris (1976) examined the effects of stimulative and sedative music on the cognitive (worry) and affective (emotionality) components of test anxiety. They found that theincremental effect of the stimulative music on anxiety was equal to or greater than the decremental effect of the sedative music. Also, the effects of the music on the cognitive component (worry) were equal to or greater than the effects on the emotional component of anxiety. They suggested that the effects of music would best be understood in terms of cognitive processes such as concentration and worry rather than primarily on the basis of the reduction or arousal of the physiological and emotional responses to the music. Person variables that affect cognitive processes also appear to influence the individual's anxiety and performance under music conditions.

Purpose of Study The present study examines the effects of autogenic relaxation training with music on academic test performance as a proxy for learning of intellectual skills and verbal information in general. The major questions this study investigates are: 1) whether autogenic relaxation training with music reduces anxiety; 2) whether the above autogenic training with music is more effective than a lecture-oriented treatment in reducing anxiety; 3) the extent to which these treatments may influence test performance through reductions of anxiety, assuming that questions one or two are answered positively. For the above questions, no significant differences are predicted, given the issues noted in the literature review.

METHOD

Subjects The subjects were 82 undergraduates in educational psychology and mathematics classes at an American University. There were 52 females and 30 males. Volunteers were recruited from two classes in each content area. One class from each subject area was randomly assigned to either treatment condition so that there were two classes each in both the relaxation training and lecture group. There was a total of 61 educational psychology subjects, with 29 subjects in the relaxation training group and 32 subjects in the lecture group. A total of 21 mathematics subjects were used, with 16 subjects in the relaxation training group and 5 subjects in the lecture group. The relaxation training group contained 45 subjects with 27 females and 18 males. The lecture group contained 37 subjects with 25 females and 12 males.

Measures The State-Trait Anxiety Inventory (STAI) (Form Y) (Spielberger, et al., 1983) was used to measure of both state and trait anxiety. The STAI State anxiety scores have been found to increase in the presence of stress and decrease under the influence of relaxation training. The STAI trait anxiety scale is considered to be a relatively stable measure of an individual's "proneness" to anxiety. Both scales consist of a 20-item questionnaire which has responses recorded on a 4-point Likert scale. Scores range from 20 to 80 with a higher score indicating greater anxiety. On the S-Anxiety Scale the subject is to indicate "how they feel right now, that is, at this moment." On the T-Anxiety Scale the subject is to indicate how they generally feel. Normative data on the STAI is included in the results section. In this study, the STAI was included to examine any possible relationship among two types of anxiety, performance and treatment effects. The performance measures used in this study were derived scores on two exams given in each class (8 weeks apart), which were standardized by using a Z-score transformation.

Procedure Subjects were asked to complete both parts of the STAI, in the classroom, immediately prior to their midterm exam. Scores on both the STAI and the exam were recorded and used as pre-treatment measures. During the last class period before the final exam week, subjects in each class received either a 15 minute relaxation training session or a 15 minute lecture about stress and relaxation training methods. The relaxation training method was basically autogenic using deep breathing, muscle relaxation, and feelings of warmth in the body. Visualization of calming scenes and positive self-statements were also employed. The entire procedure was conducted while playing Samuel Barber's "Adagio for Strings." Subjects were encouraged to practice this procedure before their final exam. The lecture-only group received a talk on the effects of stress, types of stressors, and different relaxation training methods. The lecture was designed to be a passive experience, similar to classroom lectures to which the students were accustomed and no discussion was permitted. Subjects were asked to relate the lecture information to their upcoming final exam. The connection between anxiety and performance was mentioned to both groups.

Before the final exams both treatment groups were reminded of the treatment they had received one week before. Both parts of the STAI were then administered in the classroom immediately before the final exams were given. The exams in both classes were norm-referenced and at the same difficulty as the earlier ones.

Scores on the STAI and the final exam were recorded and used as post-treatment measures. For the statistical analyses that follow, the level of significance was set at .05.

RESULTS

Analyses of Covariance. Both the STAI scores and the standardized test scores were analyzed by two-way analyses of covariance. They were used in order to adjust for initial differences in anxiety. Table I shows the means and standard deviations for the major dependent variables.

Table 1. Group Means and Standard Deviations for the Dependent Variables

Measures	Relaxation Training		Lecture	
	M	SD	M	SD
Pre-State Anxiety				
Males	51.7	13.0	44.3	13.0
Females	51.0	14.0	49.8	13.0
Total	51.35	13.5	47.05	13.0
Post-State Anxiety				
Males	47.4	13.0	41.3	12.0
Females	41.8	10.0	42.1	13.0
Total	44.6	11.5	41.7	12.5
Pre-Trait Anxiety				
Males	39.3	6.0	38.4	6.0
Females	37.4	7.0	42.2	10.0
Total	38.35	6.5	40.3	8.0
Post-Trait Anxiety				
Males	40.9	9.0	33.5	8.0
Females	35.3	8.0	36.4	11.0
Total	38.1	8.5	34.95	9.5
Mid-term Score				
Males	100.3	10.0	100.2	10.0
Females	99.5	9.0	100.3	9.0
Total	99.9	9.5	100.25	9.5
Final Score				
Males	100.3	8.0	100.2	10.0
Females	99.7	11.0	100.1	9.0
Total	100.0	9.5	100.15	9.5

Initially, content area was examined as a potential factor separately but no significant differences were found between the educational psychology and mathematics groups, for state anxiety (F (1,78) = .072, p < .790), trait anxiety (F (1,62) = .586, p < .447), nor the performance test measure (F (1,80) = .975, p < .327). Therefore, subjects from both groups were collapsed for the subsequent analyses.

The analysis of post-state anxiety with pre-state anxiety as a covariate revealed no significant differences between treatment conditions F(1, 78 = .065, p < .800) or sex, F (1, 78) = 1.901, p < .172). Trait anxiety was examined using an analysis of post-trait anxiety with pre-trait anxiety as a covariate. Results of this analysis are shown in Table 3. A significant difference was found between the treatment groups with the lecture group's having a lower post-test trait anxiety level F (1,62) = 6.567, p < .013). Again sex differences were not found for trait anxiety, F(1, 62) = 1.054, p < .31

Table 2. T-Tests for Pre-Treatment versus Post-Treatment Measures (2-tailed)

T-Test for State Anxiety (n=80)

Time	*M*	*SD*	*t*	*df*	*p*
Pre	49.6	14.0	4.20	79	.000
Post	43.05	12.0			

T-Test for Trait Anxiety (n=64)

Pre	39.1	8.4	3.63	63	.001
Post	36.2	9.5			

T-Test for Standardized Exam Scores (n=82)

Mid	100.1	1.0	.39	81	.696
Final	100.0	1.0			

* * *   * * *   * * *

The performance measure was also analyzed by using the post-treatment scores (with pre-treatment scores as covariates) but no significant differences were found between treatment groups or sex in the standardized scores, F(1,80) = .026, p < .873; F(1, 80) = .585, < .447). There were no significant interaction effects for any of the above analyses.

Table 3. Pearson Correlations for Dependent Variables

Variables	*r*	*p*
Pre-State - Pre-Trait	.35	.001
Pre-State - Post-State	.44	.000
Pre-Trait - Post-Trait	.75	.000
Post-State - Post-Trait	.45	.000
Mid-term Score - Final Score	.57	.000
Pre-State - Mid-term Score	-.02	.428
Pre-Trait - Mid-term Score	-.01	.478
Post-State - Final Score	-.28	.005
Post-Trait - Final Score	-.07	.289

* * * * * * * * *

T-tests. In view of an unexpected treatment effect on trait anxiety, T-tests were used to examine potentially significant pre- and post-treatment differences in the anxiety measures (see Table 2.). There was a significant decrease in state anxiety with both conditions combined as well as a decrease in trait anxiety between the pre-treatment and post-treatment measures. No significant differences were found in pre-treatment versus post-treatment comparisons for the performance measure, thus suggesting that decreased anxiety levels were not associated with changes in test performance.

Correlational Analyses. Since both treatments appeared similar in reducing anxiety in general, but remained neutral in terms of affecting performance, pearson product moment correlations were employed in order to examine relationship between anxiety and performance (particularly using state anxiety). Also, Table 3 is presented to examine the match between this sample's scores and the normative (STAI) sample.

All the anxiety measures were significantly correlated with other anxiety measures, as shown in Table 3. The correlation involved between pre-trait and post-trait anxiety levels was much higher than correlations between other anxiety measures. This would be expected since trait anxiety is considered as relatively stable. However, the majority of the correlations between anxiety measures and performance measures were not significant. Post-state anxiety was significantly correlated with performance measures but this correlation was modest (r= -.28, p < .005) yet well within the higher ranges in the literature.

Norm Comparison. Normative data for the STAI provided by Spielberger, et al. (1983) shows state anxiety means of 36.5 for males and 38.8 females with standard deviations of

10 and 12 respectively. Trait anxiety means are 38.8 for males and 40.4 for females with standard deviations of 9.2 and 10.2. Test-retest reliability measures show correlations in state anxiety of .54 for males and .27 for females with trait anxiety correlations of .86 for males and .76 for females. Comparisons with means, standard deviations, and correlations in this study show that trait anxiety is more comparable to the normative data provided than state anxiety. One would expect higher levels of state anxiety, however, before an exam.

In summary, a significant difference was found between treatment groups by a lower post-trait anxiety level in the lecture group. Both state and trait anxiety levels were significantly lowered following treatments. However, there was no significant change in the standardized test scores.

Discussion. The study served to explore a number of issues found in the literature relating anxiety to (school) performance. The key issues examined were:

1) Relaxation training lowers anxiety levels, particularly when accompanied by music.

2) Academic performance improves when high anxiety is lowered.

3) State anxiety is more highly correlated with performance than trait anxiety.

With regard to the first question, both the autogenic relaxation training with music and placebo conditions lowered students' state anxiety. The "placebo" treatment consisting of a lecture about stress and relaxation methods proved as effective in lowering both state and trait anxiety. The fact that the lecture-only-treatment decreased trait anxiety suggests that: a) trait anxiety may not be as stable as believed, and b) that it can be influenced by a brief, cognitive oriented intervention more than an experientially oriented one. In effect, it may be that sophisticated relaxation treatments that include practice, music and suggestion are not necessarily more effective than the simple provision of information and/or suggestion inherent in low intensity interventions.

The next question examining the relation between anxiety and performance raises questions about current theory and practice. Treatments that lower anxiety do not necessarily lead to improved performance. The best explanation for this finding may be the simplest one. Improved performance is associated with factors that are more critical than anxiety. In fact, changes in anxiety may be an attribute of some of these factors such as effort, study skills, teacher variables, content, prior knowledge and others.

Many of the studies in this area have found relaxation training effective in reducing test anxiety but not necessarily effective in improving performance. Finger (1975) found only 16 of 54 (29.6%) studies reported improvements in performance. Bedell (1975) found that both systematic desensitization and relaxation training alone were equally effective in reducing test anxiety but neither improved performance on cognitive tasks. Given that the exams used involved complex learning, this study corroborates the above findings.

Bander, Russell, and Zamosthy (1982) found relaxation training alone to be effective for a reduction in test anxiety and an improvement in performance. That study found that subjects in the relaxation training condition continued to improve past the post-treatment assessment. However, the type of performance measured here may not be as complex as in the earlier studies. Thus far, these issues appear relevant: type of learning outcomes, task difficulty and the nature of treatment.

Finally, state anxiety was found to be associated with test performance as expected. However, that correlation was modest and was found only after relaxation treatments had been conducted. This suggests that many students may have been more anxious earlier during the semester since they didn't have any testing experience or feedback on their performance. After relaxation treatments and partial grade feedback, state anxiety was lowered and only then found to be modestly correlated with performance. This suggests that lowering state anxiety for high anxiety subjects may have an adverse effect on performance. That is, this optimal level of arousal may be judged as "highly anxious" by current standards. Some students may score higher when they are allowed to (autogenically) increase their own level of state anxiety. Reducing the anxiety level of this group may have led to lower scores, thus making the post treatment grade distributions conform more to the relation predicted by theory. Support for this interpretation was found in a follow-up test showing that high anxiety students (n=18) experienced a significant reduction of state anxiety ($p < .001$) following treatments and also tended to score lower than at midterm time (p < .07). Further exploration of this trend will be examined in a subsequent replication study.

Limitations The length of the relaxation training procedure, not unlike the conditions found with "stress workshop formats," may have been much too brief to allow for the amount of training and practice used in other studies, thus limiting a thorough evaluation of treatment effects. The relaxation training procedure was also conducted with large groups of subjects, rather than individually or in small groups which may have influenced the effectiveness of the autogenic training procedure.

Among the many threats to the external validity of this study were: (a) the use of intact class groups preventing individual randomization, (b) the lack of a no treatment control group, (c) the extremely brief period of time involved in the treatment procedure which would allow for minimal treatment effects, (d) study times and practice variables were not checked, (e) the training was done in a group rather than individually and (f) test anxiety was only approximated.

It is difficult to evaluate and draw conclusions in general since most of the studies conducted in test anxiety are really analogue studies which use students preselected from a large population on the basis of an extreme self-reported test anxiety scores, instead of those who actually experience the problem of test anxiety (Bruch, 1978; Hussian & Lawrence, 1978). Research using subjects who need treatment versus those that do not, needs to be conducted in the future, particularly with a no treatment control group.

Related Findings and Limitations The lowering of trait anxiety following treatments contradicts existing theory. Yet, Thyer, et al. (1981) found that their anxiety treatment procedure also reduced trait anxiety measured on the STAI. Deffenbacher, Mathis, and Michaels (1979) and Hussian and Lawrence (1978) also found that using relaxation training, desensitization, or cognitive restructuring reduced trait anxiety as well as test anxiety. The above studies suggest first that this study's findings are not a fluke, and/or second, that the treatment effects may generalize beyond the test situation into other stressful situations. Trait measures may actually be measuring state anxiety measures, or confounded with state measures, since they involve making an estimation of a summary of past state anxiety situations. Whether or not Spielberger's 2-

factor theory is accurate, measurement problems exist that suggest a need for more sophisticated analyses of the problem.

The measures used in this and other studies to evaluate anxiety and performance appear problematic. Researchers have found test anxiety measures more appropriate to test situations than general anxiety measures (Alpert & Haber, 1960; Sarason, I.G., 1972). Hence, using a test anxiety scale for a test anxiety situation seems necessary for the evaluation of treatments.

Anxiety measures that involve self-report such as the STAI, may need to be strengthened in terms of validity data which can be criticized on the grounds that the items may be ambiguous, meaning different things to each person, or their relation to actual behavior. Also, task difficulty would seem necessary to consider relative to the intelligence or competence of the individual. If performance tests are considered "very easy" or "very difficult", anxiety treatments are not likely to be effective. Attribution theory needs to be incorporated in future research since ability and effort are likely to mediate the relation between anxiety and performance.

Other intervening variables may impact the potentially significant relation between anxiety and performance such as teacher behaviors, instructional and testing approaches.

Finally, the reduction of trait anxiety in the lecture group merits discussion. A possible explanation for this anxiety reduction might concern a cognitive orientation to the problem of performance and anxiety. The lecture had originally been conceived as a placebo condition but it appears to have served as an active treatment comprised of a cognitive as well as a suggestive component. The lecture group may have been given useful information that could have reduced worry for this population. The lecture is a familiar format which the subjects may have been more receptive than the relaxation training procedure (which may have been experienced as interfering). The reduction found in anxiety thus may have been due to suggestion which was present in both treatments and influenced both state and trait anxiety.

Conclusions As Kirkland and Holladsworth (1980) have suggested, test anxiety may be a marker for skill deficits and ineffective test taking. Manipulation of anxiety to improve performance seems naive without first addressing other factors influencing performance. It seems then that test anxiety, whether situational or not, may be simply an attribute of guidance, practice and feedback interactions over time. Anxiety's relation to performance does not appear to be of as much theoretical or practical significance as many believed since it accounts for less than 10% of the variance in test performance and little evidence exists that such relationship is causal.

In summary, this study found that both state and trait anxiety may be reduced by autogenic (experiential) and lecture treatments with no improvement in test performance. Future research needs to extend across not only various controlled conditions but also explore the validity of psychological constructs in the context of person-treatment interactions.

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Los efectos de entrenamiento en la relajación en la ansiedad y el cumplimiento académico. - Este estudio examinaba las relaciones entre la ansiedad como estado y como rasgo, y el cumplimiento. También se estimó el valor de la relajación corta con una sesión musical contra en tratamiento de clase sobre dos áreas de temas. No se encuentró mejoramiento en la realización por ningún tratamiento. De cualquier manera, se bajó la ansiedad en ambas condiciones. Se discubrió que la condición de clase bajó la ansiedad de rasgo. Se discuten las implicancias dentro el marco de la teoría de aprender y medir.

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Improving Science Education: An Integrative Approach

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Abstract. The author surveys current literature and practices in science education in public schools. Four areas to improve science education are discussed and analyzed: teachers' knowledge of content and process skills of science, understanding the nature of science, understanding the nature of the learner, and knowledge of and skills in the methods of science teaching. Developing useful teaching strategies and implementing them will help science teachers do a better job.

Introduction

The current literature on the status of precollege science education is for the most part negative. Achievement scores indicate that our students lag behind in the sciences when compared to students of comparable ages from other countries such as South Korea, Japan, and Germany (Mullis & Jenkins, 1988). There is also evidence that many students have negative attitudes toward science (Yager & Yager, 1985). The decline in the quality of science education can be attributed to a number of factors ranging from assigning teachers with inadequate preparation in the content of science to inadequate funding or facilities for science activities (Harms & Yager,1981; Stake & Easley,1978).

At the elementary school level there is a general reluctance among teachers to teach science. In many schools it is quite common for teachers to allocate the least amount of time for science (Cawelti & Adkinson, 1985; Goodlad,1984; Harms & Yager,1981; Mechling & Oliver,1983; Stake & Easley,1978). Teachers' self-reports indicate that many of them prefer to teach other subjects over science (Czerniak, 1983; Czerniak & Chiarelott, 1985; Harms & Yager, 1981).

Improving the condition of science education has been the focus of a variety of change agencies for almost three decades. The launching of Sputnik in 1957 sparked many to examine and to make efforts to improve the condition of science education. Though the intensive efforts of dedicated science educators have brought about many changes, particularly curricular changes, science education is still in need of much improvement.

In this article I have described some of the areas I consider important for bringing meaningful changes to elementary science education. Specifically described are the teachers' (a) knowledge of science content and science processes, (b) understanding of the nature of science, (c) understanding of the nature of the learner, and (d) knowledge of and skills in the methods of science teaching. A survey of the science education research literature is indicative of the importance of each of the above elements to successful science teaching. Though each area has been addressed separately, successful change is more effectively brought about if an integrative approach is implemented. Teacher development programs that integrate such important elements are more likely to result in positive long term changes than those that address piece-meal changes. An integrative approach is more efficient in addressing the interrelationships among the various areas and in making evident commonalities. Focusing on any one of these areas in the absence of others often does not lead to lasting changes. The situation is analogous to focusing on the trees and not seeing the forest.

Content Preparation

The teachers' reluctance to teach science is most commonly attributed to their inadequate preparation in the content and process skills of the sciences (Harms & Yager, 1981; Mechling, 1984; Stake & Easley, 1978; Weiss, 1978 & 1987). Many have completed only about 6 to 12 quarter hours of science as part of the liberal studies undergraduate degree requirements. Many consider such preparation very superficial and insufficient to help them teach science. Furthermore, their inadequate content knowledge might also be the reason that course work in the methods of science teaching has had little impact on how they teach.

Teachers inadequately prepared in the content and processes of science are not in a position to teach science effectively. Underprepared teachers attempting to teach science face the difficulty of being unable to diagnose student misconceptions, to provide suitable cues to enable students to develop alternative conceptions, and to ask probing questions that help students develop science concepts (Happs, 1987). Successful teachers often have obvious strengths in their pedagogical content knowledge. Their background often enables them to give explanations that are clear and appropriate. They are also able to provide concrete real life examples and analogies to illustrate abstract concepts (Shulman, 1986). Effective teaching can only be achieved when teachers skillfully integrate their knowledge of the content and teaching methods to facilitate learning.

A variety of approaches that include hands-on learning, active demonstrations, and the use of other instructional technologies are being implemented to help teachers develop necessary and sufficient content knowledge and process skills. Such an approach, however, does not preclude the need for keeping abreast with changes in science that accrue as a result of new and more compelling evidence or new paradigms. Old theories must give way to new ones if the old is not sufficient to explain new findings. The act of learning of science content should be consistent with the very nature of science. Attitudes of skepticism, curiosity, willingness to accept change, and freedom to investigate and try new and unexplored vistas are essential to learning science.

In the elementary science methods course I teach I have students identify and study the science content that is directly related to the science units they develop. The feedback I receive indicates that the readings help the students to be well prepared to teach the science units they prepare. They feel more confident and less hesitant answering student questions or asking more probing questions. The course also provides students an opportunity to empirically examine the new information they acquire from printed materials. The individual and collaborative work generates much reflective analysis of the content. The discussions also help students pit their ideas against the ideas of others in the group. Learning in a social environment is facilitated through such interactions.

Understanding the Nature of Science

How teachers view science is important to how and what they teach in the classroom. It is important that teachers have views of the nature of science that are consistent with those that are held by the community of scientists and science educators. The responsibility for helping students to become scientifically literate and functional in a post-industrial era rests heavily on teachers who as a group do not appear to have an understanding of the nature of science.

I have my methods students interview elementary teachers about their perceptions of the nature of science. An important finding, is the difficulty teachers have with this task. Some teachers appeared not to have the words to describe the nature of science. However, many teachers described science to be a field of study about natural phenomena. Comments such as "science deals with everything in the universe" and "science deals with the earth, the moon, planets, stars, and all other natural things that surround us" were not uncommon. Such comments are encouraging because the focus of science is to understand nature.

Some teachers also focused on the notion that science includes the use of specific processes that lend legitimacy to findings. However, many perceived the "scientific method" as the only legitimate procedure in scientific investigations. Other exploratory methods were often considered with great suspicion. These findings indicate that science is often thought of as the process by which scientists accumulate information about natural phenomena and the products of such endeavors, i.e., the resulting knowledge or facts about natural phenomena.

Often missing in the teachers' definitions is the affective component associated with the endeavor of science. Though teachers make implicit reference to curiosity as an essential component of the scientific endeavor, they do not make reference to attitudes of curiosity, persistence, objectivity, skepticism, and open-mindedness; and they do not address the fact that attitudes of dogmatism and authoritarianism have no place in the scientific endeavor. Teachers should be aware that the positive attitudes listed above are conducive to a realization that existing theories and explanations are tentative and subject to change in light of new and supporting evidence.

Current perceptions of the nature of science are quite different from those held around the turn of the century. Contemporary conceptions of science are more inclusive. For example, science and technology are no longer considered as distinct enterprises, but rather as an integrated system driven by societal issues. Most scientific research today is oriented toward problems of human, material, or global welfare rather than on advancing new theories. The traditional disciplines of biology, physics, chemistry, and geology are not quite functional. The boundaries of science can no longer be defined by such disciplines. Science is characterized today by more specific problems of research such as fiber optics, upper atmosphere physics, seismic forecasting, or immunology, rather than by the broad disciplines.

Contemporary issues are often not addressed when the textbook is the primary determinant of the curriculum. The science curriculum should reflect the interaction of science, technology, and society to help children function productively in modern society. This goal can only be achieved if teachers develop perceptions of science that are not traditional but reflect current changes.

Understanding the Nature of the Learner

Recently, many educators have begun to focus their efforts toward understanding how children construct meaning from their environment. There is consensus that children actively construct views about natural phenomena based on personal experiences and observations (Resnick, 1983). Often these views do not agree with those of trained scientists. Children do not simply assimilate what they are told or read. They actively look to make sense of the world by trying to fit previous experiences with new ones. Meaning is constructed and not implanted.

Teachers wonder why many children fail to apply facts and principles presented and drilled in class to interpret actual physical phenomena. For example, many children will agree that if two objects, one heavier than the other, are simultaneously dropped from some height the heavier one will reach the ground before the lighter one. Such ideas are analogous to those held by Aristotle. Children respond to formal instruction in terms of their preexisting and intuitive ideas of the world. New experiences are often interpreted in light of existing conceptual frameworks.

It is interesting to note that children often agree among themselves about how the world works and give similar explanations for natural phenomena. This research finding has important implications for classroom practice. Teachers need to be alert to students' alternative explanations of natural phenomena. The alternative explanations of one or two students should be sufficient to indicate to the teachers that other students might also have similar conceptions.

Another related finding is that student explanations are often predictable. There are certain alternative conceptions that are common to most children. The example of the falling objects described above is just one of them. Teachers need to be aware of such common conceptions and to be prepared to provide students ample examples and experiences to confront the alternative conceptions with more appropriate and acceptable conceptions.

However, it is important to note that children often resist changing their views of the world (this is analogous to the resistance for change that is evident in the history of science.) Telling children the correct answers is often only temporarily satisfying. Children quickly resort to their own constructed views when confronted with new situations that involve the physical principles that were discussed in the classroom. Often demonstrations are not adequate to help children change their explanations. Helping children form world views that are consistent with the views held by scientists might be facilitated by actively involving them in rich scientific experiences early in their schooling. Ample time and many different experiences are necessary to help children learn science. Teachers should focus on providing children with qualitative rather than quantitative experiences. Actively acknowledging the theories children commonly hold and pitting them against those held by the scientific community is also considered a useful strategy in helping children deal with new ideas presented in class.

A further and related concern that is often not adequately addressed is the mismatch between the cognitive demands of the learning tasks and the cognitive developmental levels of the students. New teachers often have unrealistic views of children and either expect too much or too little from them. The result is that children find the tasks either uninteresting and irrelevant or too complex and discouraging. Asking primary children to give explanations for phenomena with which humans have struggled for centuries is not good pedagogy. Such questions often result in children making guesses and faking their way through. The "Why?" questions can wait for later years when the child has become familiar with many different experiences that are associated with the phenomena of interest.

An assignment that I give student teachers in their science methods course is to conduct interviews with the students they teach. A variety of Piagetian tasks are included in such interviews. A recurring finding the student teachers report is that they had misjudged the cognitive abilities of the children. Based on such findings the student teachers often make major changes in their science lesson plans. Typical changes include more hands-on activities that help students better conceptualize the science concepts. An awareness of Piaget's theory of cognitive development will help teachers make more appropriate curricular and instructional decisions. Such an awareness is more likely to result in teachers' including more concrete experiences that are most suitable and enjoyable for elementary students.

Developing Teaching Strategies for Cognitive Growth

A major concern with existing science teaching strategies is that they do not reflect the spirit of "sciencing". Teaching science should help children develop science content knowledge, science process skills, and attitudes toward science that will help them meet their personal needs, effectively address societal issues, and provide adequate awareness of career choices (NSTA Position Statement on Preschool and Elementary Level Science Education, 1986). Teaching strategies that focus only on science content through the reading of textbooks and that ignore doing science are most inadequate to meet such goals. Every effort should be made to move away from simple reading the textbook and answering the questions that follow at the end of the chapters.

Much effort is being expended to help teachers develop inquiry teaching strategies. In particular teachers are being widely trained in the learning cycle approach. This particular inquiry approach includes three stages: the exploration stage, the invention stage, and the extension stage. In the exploration or hands-on stage, students gather data and evidence about a specific topic or phenomenon. In the next stage, students organize, transform, analyze, and interpret the data in an effort to make sense of their investigations. That is, in the stage of invention or explanation, students extract meaning and learn concepts. The teacher facilitates in the acquisition of concepts and principles by providing labels or new terms and by helping students state their findings in precise sentences. The third stage is characterized by the students' efforts to extend their understanding of the concepts to new situations. Applying the concepts to new situations helps students see the relevance of what they learn in school.

Many teachers trained in the learning cycle approach at CSUSB have indicated that they find the approach not only consistent with the scientific enterprise, but also interesting to the students. They have indicated that children enjoy the hands-on experiences and have better attitudes toward science. In addition to facilitating the learning of specific concepts and principles, the hands-on explorative activities stimulate a variety of critical thinking skills and science processes.

Further investigations need to be carried out to examine how the learning cycle approach might be integrated with other instructional methods. However, implementing only one approach to teaching is not only boring, but also likely to be less effective. Teachers should effectively implement a variety of teaching strategies that foster the development of cognitive skills and that will support students for a life-long education. The recommendations for teachers from the works of Jean Piaget, Jerome Bruner, David Ausubel, Hilda Taba, and Albert Bandura to name a few, should be skillfully integrated to develop teaching strategies that effectively meet the goals of science education.

Conclusions

To expect well prepared elementary school science teachers is not being idealistic. Policy and organizational changes are needed to implement an integrative approach to preparing better science teachers. Faculty involved in the preparation of teachers need to plan and coordinate their efforts to provide a well sequenced and comprehensive program for science education. Those who teach science content must have knowledge of and model teaching strategies that best suit the teaching and learning of science. "Doing science" should be of primary importance in such courses. It is through doing science that the student teachers will develop a sufficiently strong knowledge base, positive attitudes toward science and science teaching, and perceptions that are consistent with the nature of science.

Elementary science methods courses should help student teachers by providing them opportunities to practice and be coached in a variety of teaching strategies. There should be ample opportunities to examine, modify and even develop curricular materials that are best suited for children of different ages, cognitive developmental levels, and special learning needs.

University supervisors and resident teachers need to be fully aware of the course work and expectations that precedes student teaching. They should furthermore be knowledgeable of teaching strategies that lend themselves to meaningful science learning. But most importantly they should provide student teachers ample opportunities to teach science and be able to diagnose and provide appropriate and timely feedback. It is not uncommon for a student teacher to be supervised by a person who is not knowledgeable of specific inquiry methods suitable for science teaching. It is also not uncommon for a student teacher to be placed in classrooms where the resident teacher has negative attitudes toward science, avoids teaching and even prevents the student teacher from teaching science, and when s/he does teach science, uses the textbook as the primary tool in the teaching process.

Developing useful teaching strategies and skillfully implementing them will help teachers develop a better sense of self efficacy regarding science teaching. In fact, each of the areas (i.e., developing knowledge of the content and process skills of science, understanding of the nature of science, understanding of the nature of the learner, and developing knowledge of and skills in the methods of science teaching) addressed above are positively associated with developing self efficacy about teaching science.

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El mejorar la educación de ciencia: Un acercamiento integro. - El autor examina la literatura actual y prácticas en la educación en ciencia en las escuelas públicas. Se discuten y analizan cuatro áreas que mejorar: el saber por los maestros de las destrezas de contento y proceso, el entender la naturaleza de ciencia y del principiante, y el saber y la destreza en los métodos de enseñar la ciencia. El desarrollo de estrategías útiles

de enseñar y realizarlas les aydará a los maestros que hagan un mejor trabajo.

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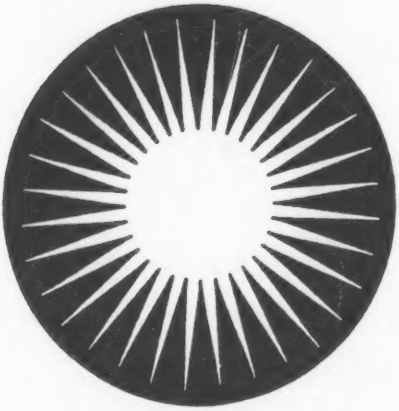

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The Editor welcomes submission of manuscripts with a focus on accelerating and improving teaching and learning, particularly with classroom suggestion or Suggestopedia. This journal publishes articles on: critical reviews, theoretical analyses, speculative papers, case studies, quasi-experimental studies, as well as reports of controlled studies of empirical research.

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REFERENCES should follow APA style according to the latest American Psychological Association Style Manual. See any issue of this Journal for examples. In the body of the text, the work of other authors should be referred to by name and publication date in parentheses as follows, "Xia and Alexander (1987) reported..." In the references the referred-to articles should be listed fully in alphabetical order by author(s), title and publication source information as follows, "Voci-Reed, E. (1987). Teaching adult learners using accelerated learning. Journal of the Society for Accelerative Learning and Teaching, 12 (1&2), 85-94." Footnotes should be used rarely, if at all.

TABLES and FIGURES should be kept to a minimum, and should supplement rather than duplicate the text material. Each table should be typed on a separate sheet of paper and placed at the end of the manuscript. Figures should be submitted in a form suitable for photographic reproduction: use India ink on a good grade of drawing paper. Photographs (black and white only) should be 5x7 glossy prints.

An ABSTRACT between 50 and 200 words should be placed at the beginning of the manuscript. The abstract should include: purpose of the work/study, design, method and description of subjects, and results &/or conclusions.

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Reading and Learning Disabled Students Improve Reading and Math Through Videoed Analytical Training

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Abstract. This study explored the use of specialized intensive cognitive training for at-risk remedial and learning disabled students, who demonstrated gains in both a regular classroom setting and a special reading class setting using videotaped instruction. The gains made on standardized cognitive tests generalized to achievement test scores in a majority of the subjects. More consistent gains were evident in the regular classroom setting where there was interclass modeling and higher self-esteem dynamics during the training. With time constraints and qualified learning and reading disabled specialists in limited supply and mainstreaming the norm, technological-oriented instruction can become an increasingly valuable vehicle to access and expedite learning for more students.

* * *

Introduction. An elementary school has only four to six years to teach reading and math skills. Because these basic skills are an essential foundation for learning in other subject areas such as science, social studies, geography, and the use of reference materials, the earlier these skills can be mastered, the better.

Unfortunately, current educational methods and policies are falling far short in achieving reading and math mastery goals. A recent report of the National Assessment of Education Progress (NAEP) noted that "almost 60 percent of high school seniors were unable to understand and summarize relatively complicated reading material written above the fifth grade level" (Mullis, Owens, & Phillips, 1990). Similar acute deficiencies were noted for mathematical skills.

A current fallout of these deficiencies is an increasing number of students who are not attaining high school senior status. The nation's dropout rate continues to escalate, with estimates ranging from 14% - 28% (Heritage Foundation, 1990), depending on the types of schools and the familial socioeconomic background represented. In general, the dropout rate is highest among public school students (U.S. Department of Education, 1988), especially those whose parents were themselves dropouts (National Center for Educational Statistics, 1987).

These dropout statistics are even more dramatic among students who are in need of special education assistance. Usually, their problem is the result of a reading or other learning disability. The data in this area is discouraging regardless of whether the students are placed in special classes or mainstreamed. *Education Week* reported that students who spent large amounts of time in special education classes had more grade failures (Viadero, 1990). Although mainstreaming these underperforming students can reduce tracking and personal stigma, they will be left behind unless the classroom teacher is able to provide individualized instruction. If learning disabled students are mainstreamed without any kind of teacher support, the drop-out rate is 52% (Viadero, 1990). Also, it may be questioned whether tutoring or individualized instruction alone significantly improves literacy in underperforming students.

Two of the deeper roots of reading and learning difficulties, learned helplessness and inadequate cognitive skills training, have in fact only recently been constructively addressed. Studies have indicated that student performance is based upon a student's own perceived ability to learn (Rosenthal & Jacobson 1968; 1989). If students have a low self-image and perceive through constant failure that they cannot learn, they may develop learned helplessness. Learned helplessness is a depressed psychological state, manifested from a lack of external gratification, in which a "give-up attitude" is maintained (Gazzaniga, 1988). Students who develop learned helplessness and low self-efficacy by the fifth and sixth grades, particularly underperforming special education students, are likely to continue on to junior and senior high school functioning at low literacy levels (Johnson & Myklebust, 1967). This may be a contributing in the dropout statistics cited earlier.

Higher-order thinking skills, typified by the ability to organize, integrate, and synthesize increasingly complex arrays of information bits, are a key foundation of learning (Woodcock, 1978; Kirk & Chalfant, 1984). They are fundamental to reading comprehension and the mastery of mathematics and science (Kaufman & Kaufman, 1983; Khami & Catts, 1989).

Higher-Order thinking skills depend upon specific cognitive abilities. Feuerstein (1956; 1980), a student of Piaget (1950), identified that specific cognitive skills could be modified with an actively participating learner, thereby increasing intelligence. Meeker (1969) applied the Guilford Model of Intelligence (1967) into a cognitive training regimen. National educational goal priorities may need to include viable cognitive skills training programs as an instrument to increased national literacy.

Educational technology research and development data is limited. A case in point, the U.S. Office of Education funds little (.5 percent of its total research and development budget) in the area of educational technology (U.S. Congress, Office of Technology Assessment, 1989). Without the combination of educational technology training and a cognitive testing assessment system for children in the average classroom, it will be difficult to determine how higher order thinking skills can be trained effectively.

An apparent inadequacy in many classrooms is the exclusive reliance on visual and kinesthetic methods of learning at the expense of the auditory method (Baker, 1990). Research has shown that integrating auditory skills is necessary for reading comprehension, written expression, and math and science acquisition (Luria, 1966; Woodcock, 1978; Kaufman & Kaufman, 1983; Kirk & Chalfant, 1984). An improvement over existing methods would be an intermodal approach incorporating visual, auditory, and kinesthetic styles of learning with equanimity (Fernald, 1943; Gillingham & Stillman, 1965, 1970; Frostig & Manslow, 1979; Reed & Hresko, 1981).

The purpose of this paper is to present such an intermodal cognitive skills training program, and to offer a preliminary assessment of its effectiveness with learning and reading disabled students in both mainstreamed and special education environments. Paradoxically, and perhaps ironically, given the present school-age generation's fascination with television, and their concomitant diminishing levels of reading achievement (Postman, 1985; U.S. Department of Health and Human Resources, 1986), the system presented in this study incorporates modern video technology as its core training vehicle. Before procedural specifics can be discussed, however, presentation of some theoretical background is necessary.

Theoretical Background of Video Cognitive Skills Training

Principles from the following four theories were incorporated into the procedures:

Structure of Intellect Model (Guilford, 1967). J. P. Guilford identified 120 cognitive abilities as composites of intelligence and learning ability. His student, Mary Meeker (1969), designed a cognitive skills retraining program now widely implemented in U.S. and Japanese public school systems (Guilford, 1984). This was among the first research in intelligence improvement applied to practical learning.

Cognitive Behavior Modification (CBM).

CBM was developed with the theoretical input of prominent psychologists. In 1977, Meichenbaum combined the theories of Piaget (1950), Skinner (1953), and Bandura (1971) into a working model. Cognitive training includes modeling and self-instructional, self-monitoring techniques by means of private speech rehearsal. This instruction is based upon the interactive, reciprocal nature of the thoughts, feelings and behaviors of one's own thought processes (Meichenbaum, 1977).

Suggestopedia (Lozanov, 1978). Suggestopedia was designed to accelerate learning in students. Suggestopedic procedures include initial relaxation along with accelerative learning techniques which include visual imagery and memorization with rhythm and vocal intonation. Applications were initially designed for foreign language acquisition but are now applied to most academic areas.

Simultaneous versus sequential processing (Kaufman & Kaufman, 1983) Simultaneous processing involves parallel imagery, or wholistic visual gestalt specialization. Sequential processing, on the other hand, involves learning information in a piecemeal, step-wise fashion. It is an instrumental component of reading comprehension, spelling, mathematics, grammar, and instructional procedures. Paivio (1971) contended that the dual-processing system of speaking (sequential processing) and nonverbal imagery (simultaneous processing) is the underlying foundation for memory and thinking. When combined into whole-brain thinking, these two brain functions allow rapid learning to occur (Kaufman & Kaufman, 1983).

Sequence training is a foundation for analytical thought and conceptualization.

When underlying sequential components are "deeply learned" using specific exercises in a drilling format, improved analytical thinking and conceptualization result. If the brain's ability to increase sequential memory-span length, strength and resilience for automatic recall is exercised carefully, whole-brain thinking can be achieved (Erland, 1989c). Longitudinal research has indicated that long-range academic and career success is furthered when sequential and simultaneous processing training are combined (Erland, 1989b).

Key Questions Addressed

Several questions were explored in this study: Could specified cognitive retraining improve the underpinnings of problem-solving and higher order reasoning, and generalize to academic achievement? Could cognitive retraining be successfully implemented using video-tape technology? Would new technologies be easier to manage and implement in the classroom if teachers and students alike could follow procedures rapidly? Finally, would students' motivation, self-efficacy, and perceived ability to learn differ in response to cognitive retraining as a function of their regular or specialized learning environments?

Method

Overview

Two groups of students, one in a regular classroom and one in a specialized reading classroom, participated in a cognitive skills retraining program utilizing video tape as the primary instructional mode. Each group was composed of learning disabled (LD) and reading disabled (RD) students, identified as such by each of their respective districts. Elements of simultaneous and sequential learning, modeling and self-monitoring were fundamental to the techniques employed in the training. Student benefits were assessed by pre- and post-treatment measurement of cognitive skills and academic achievement.

Subjects

Two remedial LD/RD groups, one in a regular classroom setting and the other in a remedial reading Chapter 1 fifth grade class, were studied for inter - intra comparison purposes. Each group of students was taught by different teachers in two neighboring midwestern school districts. Both field tests were conducted during the spring semester of the same year.

The regular classroom group consisted of seven Caucasian, fifth grade learning and reading disabled students with a mean age of 11.4 years. Three were learning disabled (LD); one female and two males. Four were reading disabled (RD); two females and two males. The students resided in a small mixed occupational community (pop. 15,000). Few, if any, of their parents had formal education beyond high school.

The special reading Chapter 1 classroom group consisted of seven mixed racial fifth and sixth grade learning and reading disabled students who had a mean age of 11.1 years. Two males were classified as learning disabled. The remaining five students were three females and two males, classified by the district as reading disabled. These students resided in a blue-collar suburb (pop. 24,500) of a major midwestern city. Five of the students' parents had a high school education or less, and two of the student's parents had college degrees.

Materials/Instruments

Training manuals. Each student received daily copies of lessons from *The Memory Retainer Mental Exercise Review Book* (Erland, 1981, 1985, 1986) and a personal folder to hold daily work. *The Memory Retainer Mental Exercise Review Book* implements simultaneous and sequential instruction directed at training primary cognitive abilities (Guilford 1967). The teacher utilized video and audio presentations of the workbook lessons in teaching the daily assignments.

Stimulus figures. Life-size speaking wooden figures were videotaped and utilized as teaching tools within a Suggestopedia design framework (Lozanov, 1978). Three male and two female figures, exhibiting a variety of vocal qualities, were featured as models for the students (Erland, 1989a) (see Figure 1). For the modeling process, students selected specific celebrity vocal identities for both themselves and the videoed characters from their favorite film or media star options.

The use of celebrity voice-overs by the students for practice and drill was explained. The students were to repeat the videotaped figures' monologue, pretending they were well-known actors auditioning for parts. Reciting in celebrity voices the monologue of the figures voices that ranged from low to squeaky to high, created interest in the lesson and memory drilling process. Like television viewing, the training offered an entertainment factor to the drilling lessons (Postman, 1985).

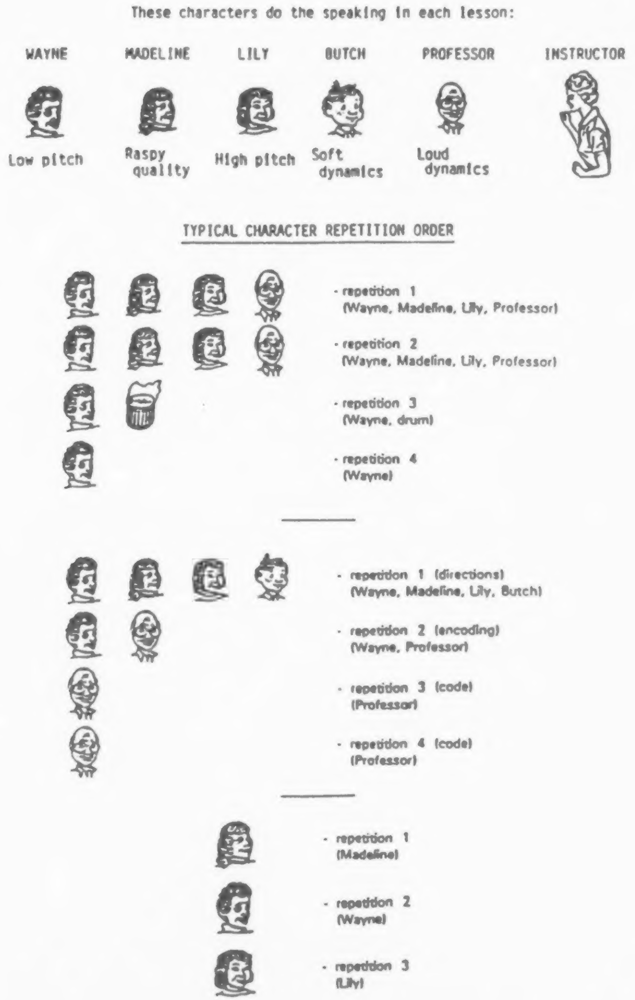
The life size videotaped figures were used as class models for the following reasons:

1. The variety of vocal intonation, including pitch variation, tonal change and sound dynamics in the characters' voices was designed to enhance visual and auditory memory (Lozanov, 1978; Render & Anderson, 1986; Gilmore, Madaule & Thompson, 1988).

2. The lineup of faces chunked, in sequence, the bits of information to be learned. The video screen pictured only one face at a time. Each face depicted and recited a chunk of information.

Thus, the continuous rehearsal rotation of the individual faces produced sequential analytical skills instruction (Erland, 1989a). The characters became an important tool in portraying both simultaneous components and analytical sequence components (Erland, 1989a), thus creating a simultaneous-sequential partnership teaching method

Fig. 1. Speaking characters in each lesson


These characters do the speaking in each lesson:
WAYNE
MADELINE
LILY
BUTCH
PROFESSOR
INSTRUCTOR
Low pitch
Raspy quality
High pitch
Soft dynamics
Loud dynamics
TYPICAL CHARACTER REPETITION ORDER
- repetition 1 (Wayne, Madeline, Lily, Professor)
- repetition 2 (Wayne, Madeline, Lily, Professor)
- repetition 3 (Wayne, drum)
- repetition 4 (Wayne)
- repetition 1 (directions) (Wayne, Madeline, Lily, Butch)
- repetition 2 (encoding) (Wayne, Professor)
- repetition 3 (code) (Professor)
- repetition 4 (code) (Professor)
- repetition 1 (Madeline)
- repetition 2 (Wayne)
- repetition 3 (Lily)

(Kaufman & Kaufman, 1983). The shift between the two systems produced both visual and auditory integration, the basis for comprehension ability (Bandura, 1971; Ayres, 1972; Lerner, 1976; Kamhi & Catts, 1989).

3. The animated, vocal characters were nonhuman, nonauthoritative figures designed to reduce the stress surrounding the intensive drilling procedures. The learners assigned celebrity identities (Bandura, 1971) to both the videoed characters and themselves. Their recital voices heightened their emotional well-being. Suggestopedia demonstrates that learning is accelerated under this condition (Lozanov, 1978).

4. Because they had celebrity identities, the characters qualified as motivating models (Bandura, 1971). Uncertain, unmotivated students felt connected with power and prestige. This format created a drilling rehearsal paradigm (Erland, 1980).

5. The figures created a place of focus, attention and concentration, all of which are requirements of the Social Learning Theory (Bandura, 1971). The unusual faces formed a gestalt framework on the video screen and activated simultaneous memory processing (Sharp, 1972; Erland, 1989a).

6. The limited movement of the wooden nonhuman characters precluded any distractions. The large, staring eyes were a focal point riveting student attention (Jaynes, 1982). The only significant movement was the mouths of the figures which moved with syllabified speech. The utilization of the figures improved visual closure, which is visual processing in a whole-pattern formation (Sharp, 1972; Kirk & Chalfant, 1984), a fundamental requirement for reading (Frostig & Maslow, 1973; Coles, 1987; Kahmi & Catts, 1989).

7. The celebrity visualization and impersonation by the students was a Suggestopedic design to create a warm, close, stimulating environment conducive to learning and memory training (Lozanov, 1978; Erland, 1980; Schuster & Gritton, 1986).

Video-Tape Recordings. Video recordings of the lessons using the character figures were the focus of the class-training exercises. The various wooden faces, acting in a progression format, modeled the exercise segments. The character figures were filmed separately in succession (Erland, 1989a).

As the figures recited individually in rotation, the learning segment cycled both vocally and visually. This cycling process formed a "strange loop phenomenon," which is an undercurrent theme found in art, science, mathematical formulae, nature and musical paradigms (Hofstadter, 1979). It is referred to as "strange" because when the process appears to end (like changing seasons and moon phases), it begins cycling over again in a recursive mirroring pattern. The reciting characters presented themselves in varying rehearsal formats (see Figure 1). The videoed action included several formats that were tailored to the lesson content and context. There were two primary formats and several secondary formats.

The same lessons and formats had accompanying audio-tapes for auxiliary classroom use. The letter sequence warm-ups and the Latin Root cool-downs were implemented with the audio-tape instruction.

The video- and audio-taped action included sequenced instruction from *The Memory Retainer Review Book* (Erland, 1981, 1985, 1986) in the following areas: sight words and reading comprehension (Frostig & Maslow, 1973; Lerner, 1976; Magnuson, 1977; Kamhi & Catts, 1989); spelling words and non-related letter sequences (McClelland, 1976; Rumelhart, 1978); math computation (Piaget, 1950); vocabulary and Latin root words (Sternberg, 1985); grammar and syntax (Kamhi & Catts, 1989); numerical digit spans (Woodcock, 1978; Hessler, 1982); following oral directions (Lerner, 1976; Hammill, 1985); following figural sequences (Meeker, 1969; Woodcock, 1978); spatial and directionality skills (Luria, 1966; Hessler, 1982); and poetry/sentence repetition (Hessler, 1982; Hammill, 1985).

Cognitive tests. A comprehensive array of cognitive skills were selected for assessment: visual and auditory sequential memory (Kaufman & Kaufman, 1983); visual and auditory closure for details (Hessler, 1982; Kirk & Chalfant, 1984); symbolic and figural content (Meeker, 1969; Rumelhart, 1978); auditory and visual memory for words (Hessler, 1982; Hammill, 1985); classifying information (Meeker, 1969); and encoding and decoding information (Sternberg, 1985; Kamhi & Catts, 1989).

Several standardized cognitive subtests from two different batteries were selected to measure each student's abilities. Four subtests were selected from the Detroit Tests of Learning Aptitude-Revised 2 (DTLA-2; Hammill, 1985), and four from the Woodcock Johnson Psycho-Educational Battery-1 (WDJ-1 Woodcock & Johnson, 1977; Hessler, 1982). These instruments were designed to measure perceptual processing in visual and auditory sequential memory and visual simultaneous memory.

Five subtests measured successive processing: DTLA-2 No. 04 (Memory For Unrelated Word Sequences); WDJ No. 03 (Auditory Memory For Sentences); WDJ No. 10 (Number Reversals); DTLA-2 No. 11 (Memory For Letter Sequences); and DTLA-2 No. 03 (Following Oral Directions). Three subtests measured simultaneous processing: DTLA-2 No. 10 (Visual Closure Word Fragments); WDJ No. 07 (Visual Speed Number Match); and WDJ No. 02 (Visual Memory For Spatial Designs).

Students completed the cognitive tests both preceding and following the 16-week treatment period. The tests were administered and scored by qualified district personnel, trained in assessment. Of the eight subtests, all were administered individually according to assessment procedures.

Achievement Tests. In addition to cognitive skills testing, standardized Science Research Associates (SRA, 1985) academic achievement tests were administered pre- and post-treatment to the regular classroom group. Missouri Mastery Achievement Tests (MMAT, Osterlind, 1987) were administered pre- and post-treatment to the special reading classroom group.

Routine SRA and MMAT achievement tests from the spring of the previous year served as pretests for the respective groups. These tests were again administered subsequent to the 16-week treatment. Testing of the specialized reading classroom group was administered by both the classroom teacher and the Language Arts Coordinator for the district. Testing of the regular classroom group was administered by the classroom teacher only. These tests were scored and interpreted by the SRA and MMAT companies.

Procedure

Training schedule. Regular 5th Grade classroom group. The students were scheduled to train during the first 30 minutes in the morning, four times weekly for sixteen consecutive weeks. This constituted two hours of training per week, or a total of 32 hours. The spring semester was selected for the training in order to reduce holiday interruptions and maintain program continuity.

The training was conducted in the homeroom in the same time frame used to perform "housekeeping duties" such as daily roll and lunch collections. This was thought to be the most effective time span to train memory and higher order thinking skills. The students were rested and refreshed and the early morning mental stimulation helped to accelerate learning processes for the remainder of the day. Due to time constraints, Suggestopedic relaxation techniques were not used in these studies.

The students used the workbook, *The Memory Retainer Mental Exercise Review Book* (Erland, 1981, 1985, 1986), with Lessons 2-40 for 16 weeks, or one semester.

Training schedule. Chapter 1 Special Reading classroom group. The training for the remedial Chapter 1 reading class was conducted for the first 30 minutes of the afternoon session, three times weekly, for 16 consecutive weeks. This constituted one and one-half hours of training per week, or a total of 24 hours. There was one less training day per week than with the other group (a total of eight fewer training hours for the 16 week semester), than had been requested by the field-testing investigator. The teacher felt that only three days could be comfortably implemented, as she needed the other two days to instruct reading and spelling. The spring semester was again selected to avoid the fall-winter holidays. This group also used the *The Memory Retainer Mental Exercise Review Book* workbook (Lessons 2-40; Erland, 1981, 1985, 1986).

Training Sequence

The study was designed to minimize initial teacher training and ongoing instruction. No inservice sessions were held. The teacher implemented the instructional manual and the videotapes according to written instructions. The teacher's role included maintaining classroom structure and discipline, leading the self-affirmations, introducing each lesson with its procedures, teaching the final lessons in following oral directions, and administering the pre- and post-tests.

Before beginning the work session, the entire group recited two self-affirmations, which are positive statements designed to set the stage, and motivate and encourage learning for each individual student. Examples of the statements are: "Learning is fun," "I believe in myself and my abilities," and "I feel good when my work is done."

The students were encouraged to show enthusiasm and support for one another. Discipline and structure was stressed throughout each lesson. The students maintained rapt attention with no visiting among them.

Following the self-affirmations, each daily training session began with two five-minute warm-up lessons, called "Warm-Ups." The exercises were designed to incorporate various visual and auditory processing skills that influence word recognition (Frostig & Maslow, 1973; Lerner, 1976; Kamhi & Catts, 1989). On Monday and Tuesday the regular classroom group warmed up with two unrelated letter-span sequences (Hatta, 1960; McClelland, 1976; Rumelhart, 1978; Coles, 1987) and two encoding-decoding flips (Piaget, 1950; Sternberg, 1985; Kahmi & Catts, 1989). On Wednesday and Thursday warm-ups were two number-span recitations (Woodcock & Johnson, 1977; Hessler, 1982) and two unrelated word series recitations (Kaufman & Kaufman, 1983; Hessler, 1982; Hammill, 1985). A similar procedure was followed each day in the special reading classroom group with the exception of Thursday, when teaching was not conducted.

The daily lessons gradually progressed in complexity during the course of the training (Skinner, 1953; Johnson & Myklebust, 1967). The information chunking procedure began with a series of three items and progressed to ten items (Miller, 1956). The students began by rehearsing three unrelated items within the categories of letters, colors, numbers and words, reciting with the videoed character models. By the end of the sixteen-week semester, the students were rehearsing strings of ten items in varying chunked formations (Miller, 1956). The objective was to enhance their encoding and decoding processes, and their ability to follow complicated step-wise procedures through memory strengthening (Howard, 1983).

The exercise drills were specifically designed to switch back and forth between simultaneous and successive processing (Kaufman & Kaufman, 1983). The purpose was to encompass the entire thinking process and to include all thinking abilities (Guilford, 1967). Therefore, students favoring one style of processing over the other soon became engaged in, and were comfortable with, both cognitive styles. Each drill included several sequential properties and several simultaneous properties. This activated a synergistic mental cognitive shift within the students (Hatta, 1960; Coles, 1987), creating multi-sensory integration (Bandura, 1971).

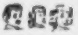
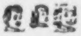
Following the daily warm-up series, specific lesson exercises were presented which lasted the remaining twenty minutes. A videotaped face and accompanying voice represented each segment of an exercise (Sharp, 1972). The students recited along with each character and cluster, gradually and systematically memorizing the sequence. They repeated the recitations using the celebrity voice-overs, in accordance with CBM self-talk rehearsal guidelines (Meichenbaum, 1977). The sequential, videotaped action became an exercise of mentally chunking a sequence of cycling patterns (Erland, 1989a). As the segments increased in length, the students automatically learned to incorporate the additional information, thus increasing memory span capacity and resilience (Spear, 1978; Howard, 1983).

The students began every rehearsal segment by orally reading each line from the workbook, in unison, without the video. The purpose of this initial rehearsal was to review the overall content of the information.

Fig. 2. Procedure for unrelated words series

CONTENT TITLE: Series of Unrelated Words MATERIALS NEEDED: Instruction Sheets

OBJECTIVE: To remember facts and names MEMORY RETAINER LESSON: 6, 7, 8

Repetition #	Directions	Time	Purpose And Modality To Improve	T V Mode	Brain Hemisphere
1.	Read series in the manual.	8 Min.	Visual-Sequential Memory		RB-LB
2.	Look at T.V. sequence. Lightly repeat overtly.		Overall Gestalt (faces). Speech-language Area Synthesis Encoding Visualization		RB-LB
3.	Focus on segments, memorizing each component. Repeat covertly.		Analysis Decode Auditory-visual	Parts 	RB-LB
4.	Covertly repeat, absorbing rhythmic beat of segments. Pull into a whole.		Synthesis Auditory-verbal memory	Single Wayne drum 	RB-LB
5.	Repeat covertly entire sentence.		Analysis Auditory-sequential memory	Single Wayne alone 	LB
6.	Independently repeat sequence.		Synthesis Auditory-sequential memory	T.V. on pause	LB

Next, the video- or audio-tape was turned on. The videoed characters alternately spoke to model each information cluster (Erland, 1989a). The students recited the entire sequence twice, in careful unison, with the character voice rotation. The student impersonation recitations were spoken deliberately to match the character vocal intonations.

The entire sequence was then repeated a third time, chorally, with one of the videoed characters who sang in a low voice and struck a drum at the beginning of each cluster. The drumbeat was designed to accentuate each chunk and activate auditory closure (Kirk & Chalfant, 1984). This procedure synthesized the chunked patterns and formed a right-brain gestalt (Spear, 1972; Elkind, 1970). Then, the sequence was repeated a fourth time chorally by the same low voiced videoed character, without the drumbeat (Erland, 1989a). This completed the synthesis of the information.

The video or audio-tape was placed on pause. The students quickly wrote the correct sequence on paper and repeated it covertly to themselves in accordance with Cognitive Behavior Modification methodology (Meichenbaum, 1977).

The students rehearsed the segment, or line, a total of four times using the chunked analysis and synthesis rotation system. After they checked their work for accuracy, the video resumed with the next exercise segment.

The following summarizes one of the primary rehearsal formats:

1. Read the item for an overview.
2. Recite in parts (3 vocal intonations).
3. Recite in parts (same 3 vocal intonations.
4. Recite with low voice and drum.
5. Recite with low voice alone.
6. Write down the answer while reciting covertly.

The daily lesson closed with the recitation of two or three Latin Root words on audiotape, their meanings and their derivatives (Sternberg, 1985). The following day, the mental exercise cycle was repeated with two warm-up items "Warm-Ups" in each category (numbers, words, letters and coding flips) and twenty minutes of the progressive pattern and sequence lessons, closing with Latin root words "Cool Downs."

Results

This pre-post test study was initiated to compare the results of the two groups; remedial reading and learning disabled students. Each student came from a different classroom to the remedial reading class. The study did not lend to a control group as the RD and LD students would be difficult to compare with other random students who attended the remedial reading class in previous years. Class inter-dynamics and size, student ability levels and teaching expertise vary from classroom to classroom. Also, some classes will have varied distributions of RD and LD students.

Table 1 shows pre-test and post-test results for the two classrooms on nationally standardized cognitive skills testing. Both groups made substantial gains in all cognitive subtest areas. Note especially the 43-point gain in visual speed (WDJ No. 02 & No. 07) for the regular classroom group and the 69-point gain on the ability to follow oral directions test (DTLA-2 No. 03) for the special reading classroom group. Though some variability is evident across the six cognitive skills subtests, the two groups made comparable overall gains: 28% for the regular classroom group and 30% for the special reading classroom group. Both groups also made large intelligence gains as measured by the DTLA-2 (24 and 28 points for the regular and special reading classroom groups, respectively). Thus, it would appear cognitive retraining via video technology can be effected among special needs students.

Table 2 presents between-group results on the two nationally standardized achievement tests SRA and MMAT. Though some gains are not relatively substantial, (i.e. below ten percent), notable is the 12-point gain in math for the special reading classroom group and the 27-point gain in reading for the regular classroom group. Thus, there is some evidence that the cognitive skills gains observed were translated into actual improvements in academic performance.

Table 1. Analysis of Cognitive Test Scores for Remedial/Learning Disabled Students

	WD2 &7 Visual Speed	WDJ 3&10 Listening Memory	DTLA2#11 Memory, Letters	DTLA2#10 Visual Closure	DTLA2 #4 List. Mem. for Details	DTLA2 #3 Follow Oral Dir.	IQ
5th Grade Classroom (N=7)							
Pre Test Mean	31.85	28.85	85.28	20.14	31.00	57.71	98
Percentile %							
Post Test Mean	74.42	61.85	92.71	40.57	59.71	93.42	122
Percentile %							
I.Q. Gain							24
Chapter 1 Classroom (N=7)							
Pre Test Mean	50.25	33.63	46.00	34.75	41.13	29.25	92
Percentile %							
Post Test Mean	66.38	56.25	72.75	59.13	63.00	98.50	120
Percentile %							
I.Q. Gain							28

Table 2. Mean Percentile Achievement Test Scores for Reading/Learning Disabled Students

	Composite	Reading	Math	Science
5th Grade Classroom (N=7) Standardized SRA Scores				
Pretest mean %	26.71	21.57	37.14	40.14
Posttest mean %	45.42	48.71	45.57	42.43
S.D.	1.94	2.71	1.65	1.52
t value	2.87	3.01	2.55	0.85
G.E. pretest mean	3.91	3.29	4.48	4.80
G.E. posttest mean	5.99	6.37	6.07	5.29
S.D.	5.91	2.71	1.65	1.52
t value	2.87	3.01	2.55	0.85
Chapter 1 Classroom Standardized MMAT Scores				
Pretest % mean	*	28.00	21.86	44.57
Posttest % mean		35.57	34.43	42.57
S.D.		20.96	13.21	14.79
t value		0.96	2.52	0.36

* Not available, nor G.E. Scores

Tables 3 and 4 are internal analyses of the individual students in the regular classroom and special Chapter 1 reading classroom. Table 3 outlines the percentile scores in reading and math of the seven students from the Chapter 1 reading classroom. The scores are measured by Normal Curve Equivalents for three consecutive years 1988, 1989 and 1990. Since the treatment ended in 1989, the 1990 scores reflect gains made.

Table 4 presents the regular 5th grade classroom's SRA Composite, Reading, and Math gains, measured in Grade Equivalents (G.E.). Four of the seven students made G.E. gains substantially above the normally expected one-year grade-to-grade improvement. These gains ranged from one to seven years in reading. One learning disabled and one reading disabled student made G.E. gains in excess of six and seven years in reading. These individuals also exhibited comparable gains on the Math and Composite subtests. Thus some students appear to profit immensely from cognitive skills retraining.

The average gain in reading (3.09) for these 7 students was significantly different (t = 2.03, df = 6, $p < .10$) than the expected GE value of 1.0. Composite and math scores were insignificant.

Table 3. Percentile Achievement MMAT Scores for Reading/Learning Disabled Chapter 1 Students

	Reading			Math			Science			Soc. Studies		
	1988	1989	1990	1988	1989	1990	1988	1989	1990	1988	1989	1990
Learning Disabled (N=2)												
J.LJ.	36	30	53*	10	26	30*	31	38	48*	48	55	53
S.M.	16	11	53*	47	18	54*	39	18	35*	28	32	53*
Remedial Reading (N=5)												
S.C.	32	30	36*	24	9	9	43	49	35	48	42	14
S.O.	15	17	4	8	1	1	18	44	35	3	19	8
M.G.	39	54	41	12	42	51*	43	71	59	42	55	32
T.G.	62	36	53*	72	56	75*	39	59	72*	48	47	28
T.S.	4	18	9	12	1	21*	22	33	14	6	22	3

* = gains

Table 4. Grade Equivalent Scores in Years by Student on SRA Standardized Achievement Tests

		Composite	Reading	Math
Regular Classroom LD Students (N=3)				
C.S.	Pre	6.2	6.3	7.4
	Post	9.8	12.7	9.9
	Gain	3.6	6.4	2.5
W.M.	Pre	3.0	2.3	3.6
	Post	3.6	2.6	4.6
	Gain	0.6	0.3	1.0
J.T.	Pre	3.2	2.4	4.2
	Post	3.6	3.5	4.5
	Gain	0.4	1.1	0.3
Chapter 1 (N=4) Remedial Reading				
M.R.	Pre	5.5	3.4	3.1
	Post	7.3	6.6	4.4
	Gain	1.8	3.2	1.3
S.H.	Pre	4.2	3.4	4.5
	Post	5.5	5.7	5.4
	Gain	1.3	2.3	0.9
M.B.	Pre	3.2	2.4	4.0
	Post	3.8	3.5	4.2
	Gain	0.6	1.1	0.2
D.L.	Pre	4.2	2.8	4.6
	Post	9.8	10.0	9.5
	Gain	5.6	7.2	4.9

Discussion

Information processing ability is the foundation of learning (Sternberg, 1985). Ways to improve underlying weak cognitive processing ability need to be explored because remedial reading and learning disabled students often pass year by year through the grades with minimal progress in their skills.

Teachers lack the time and energy to create and implement intensive, time-efficient drill and practice procedures. A solution may be found in outside development of effective media technology methods that can be applied as viable classroom teaching vehicles.

Analytical sequence training, a key element in cognitive improvement, focuses on inter-modality inter-active training (Piaget, 1950; Bandura, 1971). Step-wise procedures and chunking of information bits into memory can be taught effectively using video. The vocal and pictorial aspects activate both simultaneous and sequential memory. This sequence training, composed of encoding and decoding exercises, becomes the bridge necessary for reaching higher order thinking levels (Erland, 1989b).

The encoding-decoding memory expansion bridge may be lacking in remedial students exposed only to traditional tutorial methods of teaching. With students' visual and listening memory levels remaining static, rapid encoding-decoding ability suffers. Therefore, critical thinking does not develop and academic ability does not improve.

Although, in the study, the regular classroom gains were measured in Grade Equivalent scores and the remedial reading Chapter 1 classroom measurements were in percentile scores, both groups made comparable gains. The seven students from the regular 5th grade classroom setting (Group 1) made at least a one year gain in reading, math, or both. Six of the seven remedial reading students (Group 2) made notable percentile gains in reading and/or math. It should be noted that Group 2 had one individual without reading or math gains. He previously had reading and math scores at severe deficit levels for several consecutive years. Thus, his extremely low scores lowered the mean scores for the entire group.

Of the fourteen students from the two classes, twelve made academic gains. Ten made reading gains and nine made math gains, some of which were substantial. Of the remaining four students who did not make reading gains, one student in Group 2 maintained scores in the average reading range; three stayed at excessively low reading levels (one in Group 1, two in Group 2).

It should be noted that the one student in the regular classroom setting (Group 1) who did not make a reading gain exhibited, according to his teacher, behavioral and emotional problems. As a discipline measure, he was isolated from the rest of the class, with his desk moved to a remote area of the room. This history and the immediate punishment could have contributed to the learned helplessness and low self-esteem, exacerbated by peer rejection and scorn, lack of gratification and on-going stress from learning failure (Rosenthal & Jacobson 1968; 1989).

Three of the seven students in the remedial reading group made reading gains compared to six of the seven in the regular classroom. It should be considered whether self-fulfilling prophecy and learned helplessness might be limiting factors for instruction in remedial classes. Another consideration is that the remedial reading group (Group 2) had one day less treatment per week, or eight fewer hours of total video class instruction than Group 1.

It might be argued that the gains were a result of mere motivation by the novel media applications and the extra attention that the cognitive retraining offered. If motivation was the sole mediating factor, the gains made on the math and reading subtests would have also been evidenced in the other subtests of social studies, science and reference materials. No such trends were found in any of the analyses on either the MMAT or the SRA.

Instructional Alternatives

There are several classroom settings where cognitive retraining may be implemented:

1. The regular classroom, first thing in the morning or afternoon to aid mainstreaming

2. Summer school classes, 30 to 45 minutes per day

3. Media Centers serving for enriched learning or tutorials

4. Learning Disabled/Mentally Handicapped Resource Rooms

5. Remedial Reading classes/Chapter 1

Let us consider the final two options as settings for cognitive retraining versus the regular classroom setting.

Millions of children are identified as reading or learning disabled. Students who display a scattered profile of achievement test scores and have a tested intelligence quotient in the average range (85+) may qualify for learning disability assistance. Students who exhibit flat testing profiles (equally low scores in academic subcategories) may be accepted for remedial reading classes. More than 2 million children in the United States currently qualify for LD assistance (U.S. OoE, 1990).

The classroom teacher refers students who have difficulty in reading, math, written and verbal communication to learning disability or remedial Chapter 1 programs. Due to qualification restrictions for specialists in administering and evaluating academic achievement tests, limited resource room classroom space, and controlled case load allocations, many students remain on long waiting lists for testing and placement.

The required LD assistance can be performed on a one-on-one tutorial basis, or in a resource room with several children and a certified LD specialist. In the latter case, the child is removed from his daily classroom and taken to the LD room for help. This tutoring in reading, math, spelling or language can range from one-half hour to one-hour of instruction daily, two to four days per week. If the scheduled class contains a group of students, the teacher usually gives independent workbook assignments and moves between each of the children supervising their progress. This specialized teacher is often burdened with heavy case loads and has to simultaneously coordinate several assignments at varying reading levels. Whether a teacher can implement cognitive retraining for an entire class, while additionally tutoring each child, is questionable.

The reading disabled child is also removed from his classroom and taken to a reading class where he will be instructed in a group of three to fifteen children. The teacher is under pressure to teach each child to improve his oral reading and comprehension. Coordinating the curriculum becomes difficult as the students are at varying reading levels. The reading teacher perhaps has an easier task than does the learning disability specialist. The LD specialist instructs all subjects while trying to remediate communicative disorders, whereas the RD specialist teaches only reading.

Cognitive retraining for the LD/RD teachers is an option only if it can be structured comfortably within existing teaching demands. It will succeed only if teachers and administrators can begin to see early results for the time and effort put forth. However, it might be kept in mind that the basic reading skills might need to be in place for a year or two before gains can be made in standardized subtest areas of science and social studies.

Exploring the Use of Video Technology

Cognitive retraining using video-tape teaching methods has five major advantages over computerized practice and drill programs:

1) While only one student can use a computer terminal and keyboard at a time, one video monitor can instruct thirty or more students simultaneously.

2) By using a variety of voices and faces, video teaching can train auditory-visual sequencing (Erland, 1989a). Computer programs are primarily visual simultaneous in-

struction with some visual sequencing. The mechanical voices of computers offer little, if any, auditory sequence training.

3) Video instruction is time-effective. Several drill and practice segments can be taught in a thirty-minute time frame. This efficiency removes the drudgery from drill and practice sessions for both the students and the teacher (Mecklenberger, 1990). Computer programs, on the other hand, can be quite time consuming, with some taking as long as an hour or more to complete a drill and practice session.

4) Since programs can be transmitted through interactive long-distance learning networks, video instruction is cost-effective and equalizes learning opportunities (U.S. Congress, Office of Technology Assessment, 1989). Many districts can receive the training simultaneously.

5) Finally, television is accepted readily by learners as they have grown up with this medium (Greenfield, 1984). Postman (1985) indicates that offering an entertainment world for instructional purposes appeals to students who have utilized only a limited print world.

Conclusion

At-risk remedial and learning disabled students appear to benefit from intensive, specialized cognitive training. This study demonstrated gains in both a regular classroom setting and a special reading class setting using videotaped instruction. The gains made on standardized cognitive tests generalized to achievement test scores in a majority of the subjects. More consistent gains were evident in the regular classroom setting where there was inter-class modeling and higher self-esteem dynamics during the training. With time constraints and qualified learning and reading disabled specialists in limited supply, technological-oriented instruction can become an increasingly valuable vehicle to access and expedite learning for more students. Further research is necessary to explore the effects of using videotaped instruction to accelerate learning procedures in reaching and benefitting a broader spectrum of students.

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Resumen. Este estudio exploró el uso de especializado cognitivo y intensivo entrenamiento para unos estudiantes reparadores y aprender-incapacitados, que demostraron ganacias en ambos un salón regular de clase y un salón especial de clase de lectura usando la instrucción de video-cinta. Las ganancias hechas en pruebas estandardizadas y cogni-

tivas se generalizaron a las puntuaciones de pruebas de logramiento por la mayoridad de sujetos. Ganancias más constantes fueron manifiestas en el salón regular en donde había dentro de clase modelando y más altas dinámicas de auto-estima durante el enseñar. Con limites de tiempo, y con las especialistas calificados en deshabilidades de aprender y leer en la oferta corta, la instrucción con orientación technológica se pueda ser un vehículo con cresente valor que accesar y expedir el aprender para más estudiantes.

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Suggestopedia's Evolution in the West and in the East

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Abstract. The author presents her view of the problems Suggestopedia faced in its introduction to the former Soviet Union, its acceptance and a course outline of the current teacher-training program there.

* * *

Nearly 30 years ago the world came to know Lozanov, his ideas of teaching, his method that gave unexpected results in language teaching in a wonderfully short period of time. "Revolution in teaching"—this is how suggestopedia was estimated. And that was true. But was the society and were teachers ready for that revolution?

The basic contradiction, the way I see it, lay in the fact that, on the one hand, the development of civilization, technology in the 60's put forward the necessity to protect man's psychic and at the same time to activate human potential. This was the core of Lozanov's method. And thus viewed, it came at the right time. However on the other hand, the teaching staff was not yet ready to radically change the mode of teaching to replace a rational approach to teaching that had been in operation for centuries by a new, humanistic, highly creative approach. Suggestopedia offered a free choice both: to the teacher and the learner, their new relationship revealed vast possibilities of man, his memorizing abilities in particular; it introduced art in a broad sense of the word as an integral part of learning and teaching.

No doubt, creative teachers and creative people en masse find the approach very attractive. But creativity is the last thing to be formalized, structured, analytically checked and it looks as if it can't be interpreted in terms of rigid rules of algorithms of teaching. I have a feeling that this is one of serious reasons why suggestopedia is not being widely used.

It might explain the fact why Lozanov's followers, trying to comprehend and verify suggestopedic theory, highlighted only those of its assumptions that can be formalized. Their attention was mainly paid to the memorization of vocabulary items, with or without music and relaxation. I don't find memorization data supplied by Lozanov or his followers convincing enough as they reveal the recognition level alone, that is receptive but not productive level. That is why different researchers get different data in the research of this kind.

That was one of the reasons why we turned to psychological interpretation of the memorization problems. Human memory and the learning process — this has always been a classic problem in traditional psychology and pedagogy, and remains so nowadays. Different psychological schools have given it due consideration. Depending on how the problem was solved, it was differently reflected in various methods of teaching. First, there were data about the volume of memory in memorizing different types of things, about the time distribution of memorization and repetition. These were later supported by the data showing correlation between memorization and motivation, the set, the organization of the material. Memory began to be viewed as still another psychological phenomenon.

Last century, when the idea of the direct connection between memory and thinking gained weight, the problem of intentional and long-lasting intake of knowledge came to the fore. Later on, when memory was studied alongside with perception, attention, thinking and so on researchers became aware of the fact that fully comprehended material was better remembered.

A famous Soviet psychologist, wrote at the time: "Unintentional memorization can be monitored in an indirect way. Teaching faces an important task — to organize the learning activity in such a way that the learner memorizes the most essential material when he/she is busy with the material itself rather than its memorization. American theories of memory and learning still view unintentional memorization as casual.

Thus, research data on unintentional memorization, when applied to pedagogy show that in order to achieve better learning, teachers should give more consideration not to repetition proper, but to the ways of the material presentation, organization of the learning activity, interests formation, and so on.

I'd like to say that these ideas were pronounced back in the 40's. Unfortunately, the above mentioned research data were ignored by the learning process on a large scale. And nothing has changed so far. There are still lots of foreign language textbooks, which contain lists of new words with the instruction: "learn by heart." Psychological research data didn't find their way into pedagogy.

No drastic changes were introduced in the learning process later in the 60's, when Lozanov's revolution ideas gained weight. Without directly referring to the psychological research in the field of memory and memorization, Lozanov, in his own way, contributed to the development of the theory of unintentional memorization. Lozanov offered basically new ways of the learning activity organization and the new material presentation.

Our concept of learning incorporates both Lozanov's ideas and some psychological research data, namely a theory of unintentional memorization. The problem of memorization is determined by an integral approach to memory as a combination of memorization, storage and extraction processes.

Using these ideas as the foundation, we have designed our system of teaching which deals with ways and means of the learning material presentation and further work at it.

We can by right say that we have transferred some achievements of psychology and Suggestopedia to the teaching process proper. Which allowed us: to work out our own concept and to create our own method.

Let me mention some of the means the teacher resorts to in order to facilitate unintentional memorization of a large amount of the new material. The means are the following: emotional coloring (one and the same sentence is given in various emotional contexts), gesture (expressive, unusual, typical, functional, associative, cultural, related to grammar, phonetics, etc.), mimicry, body-movements, rhythm, rhythmical organization of the text, melody, associations (imaginative, analitory, absurd, etc.) and many others.

Storage in the learner's memory and extraction are facilitated by a set of exercises designed to form a habit of using the memorized material (both under rigid monitoring or of a free choice). But this problem concerns didactic materials. In my opinion, many people share one and the same misconception: they expect Lozanov to supply them with didactic research and didactic descriptions. But, thank God, Lozanov and didactics are worlds apart. Or we would not be having suggestopedia. Lozanov's greatest merit is his basically new approach to teaching, to a learner's role, a new philosophy of teaching altogether. As for the techniques of teaching, there are still a lot of things that need be researched and proved. I believe this is not that necessary after all, techniques might be individually interpreted in terms of Lozanov's theory when applied in certain conditions.

All of us who adhere to suggestopedia share its main concepts. Whenever we find its theoretical assumptions deficient we develop its theoretical foundation by borrowing from other sciences. Take our concept for example which incorporates some data of social psychology, socio-psycholinguistics, psychology of communication, pedagogy and foreign language teaching. That naturally presupposes that we all may and do go different ways while implementing scientific ideas in concrete courses of teaching. There are still things that suggestopedic teachers belonging to different trends keep intact: psychologically favorable climate, teacher-learner confidential relationship, creative approach to teaching materials, incorporation of music, songs, games, etc., introduction of lengthy texts (in two languages) followed by recitation against background music, non-traditional mistakecorrections and skills monitoring. Those seem to be basic things that unite us all. Other things, including textbooks, may be quite individual. I believe, different ways of suggestopedia development in the West and in the East are due to different social, economic, historic, political conditions, hence — different mentality.

In the West, where there has always been freedom of migration, people have a good chance of learning a language in the country of the language. Besides, there has always been a network of State-independent schools which were free to choose and apply new methods of teaching. It's important to stress the fact that in the West a learner is oriented towards the teaching process (that is how teaching is conducted) rather than its results (expectations and requirements). This is but explicable as he has free access to the world, he feels socially and psychologically protected, though the problem of man's psychic protection and development of his psychic potential cannot be discarded in the West either.

For the above-stated reasons suggestopedic teachers in the West focused on the following problems: music, relaxation in various forms including meditation, yoga, etc.

Linguistic, methodological and socio-psychological aspects of suggestopedic teaching in most cases are outside the interests of Lozanov's followers in the West.

In our country, on the contrary, these are the aspects that gave fuel to numerous scientific research and were reflected in many dissertations. Specific social, historic, political conditions, our mentality on the whole and pedagogic mentality in particular made it necessary for us to develop suggestopedia in a specific way, and first of all prove its scientific validity. And it is our country that needs suggestopedia and suggestopedic development of a person more than any other country. Our suggestopedia is more rational, though we obviously need the irrational, too. Take it as a paradox or as our reality.

To make it clear what we mostly concentrated on let me tell you what problems have been studied within the framework of our research.

I. Purely didactic problems.

1. Progress of foreign language teaching in the 20th century. Linguistic and psychological foundation of the teaching methods, Suggestopedia included.

2. Modern teachers' trends.

3. Teaching foreign languages as means of communication.

4. Teaching complex materials.

5. Choice of language material and its textual organization.

6. A system of exercises in oral and written communication.

7. Steps of new material presentation and its activation (training and authentic communication).

8. Promotion of memorization.

9. Mistakes' correction at different steps of learning.

II. Psychological problems

1. Team formation (group of learners).

2. Forms of group interactivity.

3. Learners' functional state in different forms of group interactivity.

4. A learner's mode of behavior within the group.

5. A learner's social and psychological orientation in the group (self-esteem, assertiveness, etc.).

6. Psychological analysis of group dynamics.

7. Communication barriers and ways of overcoming them in team activity.

8. Group dynamics as a factor promoting learning.

9. A dialog in communication.

10. "I"-concept in intensive learning.

Now, some words about the implementation of suggestopedia which frankly I find insufficient.

1. As to our country this insufficiency can be mainly explained by the fact that our teachers were utterly unprepared for Lozanov's ideas. The very term Suggestopedia was rejected as incomprehensible. Lozanov's ideas ran counter to the stereotyped notion of the teaching process and teacher-learner relations. By the way, it was for that reason that 20 years ago we had to substitute the term "intensive" for "Suggestopedic" as more acceptable to our

teachers. We are fully aware of the disadvantage of the term "intensive," especially at present, but 20 years ago it gave us a chance to preach Lozanov's ideas and let our teachers come to know them. Unfortunately, the term "intensive" stayed.

2. Another reason why Suggestopedia is not used in the West and in the East is the fact that it is mainly applied to short-term courses. The narrow range of the application resulted in the false idea that Suggestopedia is restricted in its usage.

3. Still another serious obstacle on the way of introducing Suggestopedia in schools and higher learning institutions (in our country, anyway) is the existing curricula, time-tables, examination requirements. In a word, rigid structural forms of the teaching process and Suggestopedia can't be squeezed into them. However we've got some interesting experience of implementing a teaching program for schools. And it is being done here in Helsinki, in a Finnish-Russian school. So far we have got a system for teaching 6 year-olds (preparatory class) which is carried on in classes from 1 to 4. It will take another year to complete the program of teaching Russian in the primary school after we have finished the second class part of the

program. For us the work is existing as it is aimed at working out an absolutely new model of long-term teaching. We regret to say that there's a threat that further work at the joint Russian-Finnish program may be interrupted for some social and economic reasons.

4. Broad usage of Suggestopedia was also hindered in the West by lack of an adequate number of theoretical and applied publications, and text-books available for teachers and learners alike.

5. Some elements (music, dancing, dramatization) that were brought to the fore by suggestopedic teachers surprisingly gave the opposite effect: instead of attracting teachers they frightened many of them away. Some officials in Boards of Education declared that Suggestopedia was no good for schools and universities because of its flippant nature. Many believed that Suggestopedia was not for everybody. It required special talents that an average teacher may not possess. The belief was supported by the fact that often suggestopedic teachers were not professionals but former singers, actresses and the like (this time, though, I'm not referring to my country).

6. Another reason for insufficient usage of Suggestopedia the way I see it, is that we have not got a fundamental training system for suggestopedic teachers. What is done to the effect in different countries and even what is suggested by Lozanov and Gateva is not always sufficient in my estimation. For instance, if we train language teachers we should take into account their previous education, their ideas of pedagogy, methods of teaching and we should explain to them all the existing educational notions scientifically. Take for example the teaching material selection, the text organization, grammar or phonetic drill, reading skills, types of exercises, a lesson pattern, preparation for lessons and so on. The teacher should be shown another approach to all these problems and we should convince him/her of its effectiveness.

Well, so far I have been trying to single out the main reasons which, I suppose, account for the insufficient implementation of Lozanov's ideas.

I suppose everything I have said points out to the trends in our work that can be developed jointly. Undoubtedly, the best possibility would be an Institute of Suggestopedia, and that was discussed at the conference organized by Lozanov in Zalzburg in the autumn of 1990. It might be worthwhile to set up an international association of Lozanov's followers. Though I fail to see in which form the cooperation can be organized, I admit there are four major lines along which we can work together:

1. advocating suggestopedic ideas, making them accepted by teachers, official, etc.,

2. researching and experimentally testing ideas that will be selected as representing common interest,

3. compiling textbooks of different languages for different groups of learners,

4. and finally, working out programs of suggestopedic teachers' training designed for different terms, and conducting joint training programs in various countries.

I can show you our teacher-training program. That will give you an idea of how we train teachers. I hope that might be of some interest to you.

TEACHER-TRAINING PROGRAM

Time-Table (training period, eight weeks)

1st week

Lectures (time period - one week)

Trends of foreign language teaching (review)	45 min
Methodology and its links with other sciences	45 min
Intensive teaching development	45 min
Definition of terms "intensive teaching," "method," "system," "course"	45 min
Principles of intensive teaching	90 min
Model of learning to communicate in a foreign language	90 min
Social and psychological analysis of communication	180 min
Teaching process and its organization	90 min
Teaching process and its content	90 min
Suggestopedia abroad	180 min
Teaching material presentation	90 min
Teaching material activation	90 min

Psychic processes in foreign language learning 90 min

Social and psychological analysis of communication 90 min

Communicative exercises 90 min

Theoretical approach to psychodiagnosis 90 min

Workshop "Hold hand" (foster friendly relations) 180 min

2nd - 4th weeks

Language classes and seminars (time period - three weeks)

Attendance and analysis of language classes given by the staff teachers

Workshops (the same time)

Music in intensive teaching 120 min

Communicative tasks 180 min

Grammar in intensive teaching 120 min

Optional classes (the same time)

Britain and the British 180 min

Present-day English	180 min
France and the French	180 min
Germany today	180 min
Summing up	180 min

5th week

Lectures and Workshops (time period - one week)

Principles of intensive teaching and system exercises	180 min
Workshop "Assertiveness"	180 min
Psychotherapy and psychohygiene	360 min
Workshop "Communicative tasks"	180 min
Social and psychological analysis of communication	90 min
Workshop "Intensive teaching and intellectual games"	90 min
Monitoring and mistake-correction	90 min
Text as a cultural phenomenon	90 min

Workshop "Principles of team formation" 180 min

Teaching and methodological complex 90 min

Psychological aspects of teaching adults 90 min

Workshop "Social and psychological analysis of communication" 180 min

Optional seminar "Fundamentals of Voice Technique" (the same time)

6th - 8th weeks

Pedagogical practice (time period - three weeks)

Attendance of language classes given by the teachers (trainees) 360 min

Analysis of the classes 180 min

Workshops 180 min

Final discussions 360 min

Group and individual interviews 240 min

* * *

La autora presenta su vista de los problemas que la Sugestopedia encontró en su introducción en la previa Unión Soviética, su aceptación y un trazado del curso para el entrenamiento de maestros allí.

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Cases in Counseling Using Lozanov's Memory Technique

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Abstract. The authors tested the applicability of Lozanov's Memory Technique with students who wanted help with learning and preparing for exams. Five such cases are presented, and the outcome was successful in all cases.

* * *

The use of case study methodology for investigating counseling techniques, which seems to work, offers a unique opportunity for counselors and other persons in the helping profession interested in research to investigate the workability of the techniques - because conventional methodologies tend to demand specified treatment time periods (Hersen & Barlow, 1976). Included among the many counseling needs brought to counseling centers are: (1) the need to save time learning materials and (2) how to save time preparing for various exams. Lozanov (1967 & 1978), a Bulgarian physician and psychiatrist, noticed that a technique he named Supermemory sped up learning from five to fifty times, increased retention and required little or no effort on the part of the students. He observed that students could also give the number of steps they had made on a staircase and to and from a bus stop, panes in a window, and buttons on their clothing - without having consciously counted them, which seems related to the notion of the victim of a robbery being able to almost accurately describe the robber and get-away car to an artist for drawing when placed in a state of hypnosis. Lozanov was joined by Gowan (1975) with an implication that the human mind is like a movie camera mounted onto a film projector - and that this camera films everything - sights, sounds, smells, tastes tactile sensations, the movements we make, things we say to ourselves and others, etc. They implied further that when the body is in a state of relaxation (Wolpe, 1958), when it is free of fear, anxiety and all distractions that impede its functioning, the projector can be directed to rewind and play back anything the camera has filmed. A hypothesis drawn here is that the mind's camera films reading materials, lectures, sheet music, tape recordings, words to songs, languages - any material needed for test-taking purposes or performance. It is further inferred that this information is stored on a film-like substance in the brain and can be played back instantly or whenever needed. The purpose of this study was to describe five counseling cases with Lozanov's memory technique used as a tool for satisfying selected students' counseling needs targeted at : (1) learning sheet music, (2) learning new subject matter, (3) preparing for semester exams, (4) preparing for the doctoral Qualifying Exam, and (5) preparing to take the Bar Exam for law students.

METHOD

The participants were indirectly recruited to participate in this study. For example, the first author demonstrated how Lozanov's technique could be used to facilitate and expedite learning mathematics on a local television station - the series was run several minutes on a local "Night-Desk News" program five nights at 10:00 p.m. Immediately and long after the program was run, high school, undergraduate, graduate and law school students volunteered themselves to participate in counseling using the Lozanov memory technique. The counseling needs presented by the students were in the order described below.

Case #1 - Learning Sheet Music

The first author was approached near the end of the day on a Friday by the participant in Case #1, who was a high school band member, for help to learn a piece of sheet music that was to be played in district competition the following Saturday morning. The participant had been trying to learn the music for several weeks and was not prepared to compete the next morning. He asked if the technique that was demonstrated on the television program would help him satisfy his need to participate in the contest. After the "let us see" response was given, the participant learned and recorded one line at a time on a cassette recorder until all the music was completed. The participant was then prepared for and placed in a state of relaxation. Before playing the music back, that had been synchronized on the tape, the participant was told that he would hear some music playing that he had recorded and that he would able to play it on his tuba, which was his instrument of choice, any time in the future when he was asked to do so. He was told further that he would awaken only after his subconscious mind had recorded the music as he had heard it and was ready for him to play it all the way through without the hesitations witnessed during the recording session.

Case #2 - Learning New Subject Matter

The participant in this case was a female college student at a local university who was a member of a group of students that wanted to receive more information about the program they had seen on the television station. She was the one to volunteer as a subject of the experiment. When asked to submit some reading material she wanted to learn, but had not read, she submitted the Articles of the Constitution, which she had only copied from another student's notebook. She did not want us to use this material because she had not read it. The participant was told that was what we wanted - that we did not want her to have read the material if she had scanned or surveyed it. After the participant was placed in a state of relaxation, she was given the suggestion "Your mind will now go back to the moment you began writing the Articles of the Constitution in your notebook and you will re-live the writing." "Before you awaken from this state of relaxation, you will remember each word of the material. In fact, you will now tell us what is written on each line of the paper on which you have written the Articles."

Case #3 - To Save Time Preparing for Semester Exams

This need was addressed using entire classes and even large groups of students who were preparing for semester exams. Professors either brought their entire classes to a center where they received the treatment or the treatment was taken to places where they were assembled. Once the students were made aware of how the brain works, goals were set - such as the scores they ideally wanted to earn on their finals. Those students who agreed to participate were placed in the state of relaxation and directed to let their minds go back (rewind) to the first day of class (each class) and to re-live all of the experiences, such as lectures, readings, films, discussions, and conclusions, up until that present moment. A suggestion was then made that once all experiences had been replayed or relived, their minds would move forward and let them see themselves receiving their final exams, recognizing answers to the various test items, responding to them, turning their papers in, and receiving their grade slips from the Registrar's Office. The final suggestion included directing the students to get in touch with euphoria, happiness, or excitement they feel by "seeing the success." The term success was defined as receiving their ideal semester average on the grade slips. The suggestion included the notion that they would make smiles on their faces and awaken from the state of relaxation - holding onto the emotions they had envisioned as a result of being successful on their finals.

Case #4 - Preparing to Take the Doctoral Qualifying Exam

The participant in this case was a native of the local community, but was pursuing the doctorate outside the state - nearly 2,000 miles away. The student first called long distance to indicate that she had learned about a memory technique having been demonstrated on one of the local television stations - that a relative had discussed it with her. The student wanted to fly to the local area to receive the treatment, but when is was suggested that it could be received over the telephone, an appointment was made to do so. As planned, the telephone rang at exactly 2 p.m. local time on the date of the appointment and it was the participant calling to receive the treatment. Subsequently, the participant was directed to find a comfortable couch or bed to sit or lie on. Once this was completed, the participant was placed in a state of relaxation and received these suggestions: (1) "let your mind go back to the first day of your graduate study at...," (2) "relive all of the experiences you had associated with each course," (3) "you are not concerned with any sounds except the sound of my voice - if you hear other sounds, they will not distract you, but rather help you relax further and deeper," (4) "as soon as you remember all the material you have studied for your doctorate, your mind will let you see yourself taking the Qualifying Exam - feeling relaxed and unnerved," (5) "you are now taking the exam - with no difficulty. Recognizing the relationship between materials you have studied and the items you are asked to respond to on the exam," (6) "you sense passage of the exam already," (7) "you're beginning to feel the excitement already over having passed the exam," (8) "after you complete the exam, a few days will pass and you will receive the notice you've been waiting on - notice of passage of your Qualifying Exam," (9) "as soon as you receive the notice, you will yell "Whoopee!" and awaken from your state of relaxation."

Case #5 - Preparing to Take the Bar Exam

This case involves a group of law school students - all seniors. One of the participants not only needed help in preparing to take the Bar Exam, but also to pass a course in which he was failing. Once the participants were clear as to how the technique used in this study works, they were asked to set their goals - ideal goals they would feel real excited about achieving. The student needing to pass the course was asked to set an additional goal - in accordance with his counseling needs. This activity was followed by the relaxation component of the treatment. While in the state of relaxation, each participant was directed to: (1) "let your mind go back (rewind) to the beginning of your course and programs" (pause), (2) "now relive every experience you had in each of your courses while in law school" (pause), (3) "now let your mind move forward in time and see yourself receiving your Bar Exam" (pause), (4) "notice how comfortable you feel" (pause), (5) "notice how well you're remembering the information you need in order to respond intelligently to test items on the Bar Exam" (pause), (6) "see yourself completing your final and then the Bar Exam" (pause), (7) "see yourself receiving the results of your final exam and the Notice of Passage of the

Bar Exam" (pause), (8) "the excitement you feel for successfully passing your course and the Bar Exam will awaken you from this state of relaxation".

RESULTS

The results reported in this study are limited to the verbal feedback given by the participants. The effects of the treatment in satisfying the participants' counseling needs are described here for each of the five cases so that inferences can be made as to the effectiveness of Lozanov's Super memory technique.

Feedback from the Treatment in Cases 1 Through 5

Case #1 - To Learn Sheet Music

The participant was taken to a nearby town to compete for the position of tuba player in an all-district band. As we were late, the participant was hurried out even before a proper parking place was found. While these authors were still drinking coffee in the waiting room and meeting other people related to the contestants, this participant was already back. He was asked why he was not competing and the response was "I'm through!" "What I can't figure out is how

I played the music all the way through and not feel nervous!" "I won second place among nine students competing for the position!"

Case #2 - Learning New Subject Matter

While we and other members of the participant's group looked on, she verbalized each Article of the Constitution, not leaving out a line - while in the state of relaxation. When the participant awakened, she was told by the group members that no line was missed. The participant jumped from the chair and ran out of the room over disbelief.

Case #3 - Preparing for Semester Exams

Each of the participants was asked to raise their hands if they saw themselves achieving the goals they had set - to achieve their ideal score on their final exams and subsequent ideal semester averages. The only participants who could not raise their hands were those who indicated that they did not understand "that Biology in the first place," and those who missed too many classes.

Case #4 - Preparing to Take the Doctoral Qualifying Exam

It was stated above that the participant in this case was directed to yell "Whoopee!"

when she visualized seeing success on the Qualifying Exam and awaken. After nearly one hour of waiting on the telephone, the first researcher was awakened by the participant who yelled, "Whoopee!" The participant asked, "Where am I?" However, once coherence was regained, the participant realized her location. When asked to share with the researchers what had happened, the response was, "I feel confident I am going to pass the exam the next time I take it." This was not the participant's first time preparing to take the exam. Several weeks later, the participant called to break the good news, "Get ready for a party, when I come to town", she said.

Case #5 - Preparing to Take the Bar Exam

Feedback was received from only two of the law school students who took the treatment, the one who was failing in one law course and another who lived in the local community. The wife of the participant who was failing the law course indicated that he received an "A" on the final and a "B" out of the course. The participant who needed only to pass the Bar Exam, is now a practicing attorney in the local community. Both passed the Bar Exam.

DISCUSSION

The results (Cases 1 through 5) clearly show a pattern of success using Lozanov's memory technique to satisfy the counseling needs of the participants used in this study. While the results may not provide any statistical support with which to predict future outcomes of this treatment with students having similar counselor needs, they do offer information from which to formulate testable hypotheses - that may be statistically tested and analyzed.

CONCLUSIONS

Lozanov's memory technique can be used as a tool for helping students at high school, undergraduate, graduate and law school, to save time learning new materials and in preparing for professional exams.

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Resumen. Los autores probaron la aplicabilidad de la técnica de memoria de Lozanov con unos estudiantes quienes deseaban alguna ayuda con el aprender y el preparar para examenes. Cinco casos se presentan, y el resultado salió con éxito en todos los casos.

* * *

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Using the Right Brain to Teach Writing

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Abstract. The author reviews, analyzes and discusses the brain hemisphere literature from the viewpoint of ameliorating the teaching of writing. Several novel ideas are developed and suggested for use in English composition classes. One of the major such concepts is "hemisphere hopping," using either the left or right hemisphere or both in an integrated way in writing.

* * *

As composition teachers, one of our goals should be to aid students to learn to use both brain hemispheres separately, and to link or merge their brain hemispheres together for better writing. This goal may require a greater emphasis on right-brain functioning in particular than is normally allowed. Accelerative learning and teaching, in fact, often recognizes the very same psychological functions that in brain-hemisphere parlance are considered part of right-brain activities: for example, the use of music, visual art, and tactile/kinesthetic experiences, and an emphasis on holistic and gestalt teaching and learning. I'd like to pursue the idea of using the right brain more in the teaching of writing by developing this idea in three areas of writing: linguistics, basic (remedial) writing, and college-level composition.

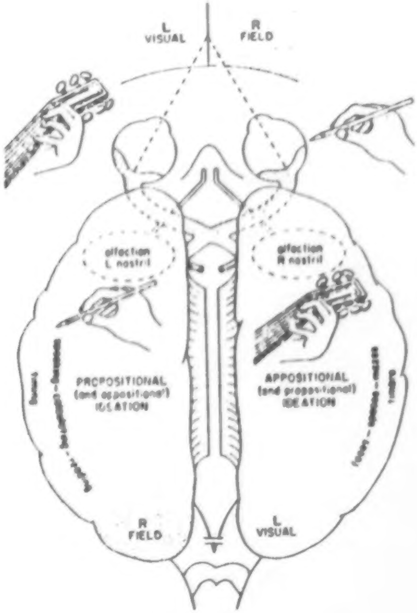
A quick review of split-brain theory first may be in order. Briefly, the human cortex--the "conscious" or "evolved" top section of our brains--is divided into a left hemisphere (LH) and a right hemisphere (RH). The two hemispheres are lateralized: that is, each side is somewhat specialized in the functions it performs. Language is one of these specializations. Our left hemisphere appears, from split-brain and aphasia subjects and from other research, to be our verbal/language hemisphere, and our right is our visual/conceptual hemisphere. For example, as Victoria Fromkin and Robert Rodman (1983) say in *An Introduction to Language*, "Injuries to the left hemisphere result in aphasia, but injuries to the right hemisphere . . . result in spatial perception difficulties, problems in pattern recognition, and other cognitive deficits" (p. 365). In other words, the LH is our "I-am-verylogical"/talking hemisphere, whereas the RH is our "Aha--got it!"/visual hemisphere. The LH is logical, analytical, and verbal. The RH is intuitive, visual, and emotional. Anthropologist David Givens (1984) at the University of Washington says that instincts and emotions also come up through the RH much more easily than through the LH. (See Figure One.)

Having reviewed the above, let's take a look at a few ways in which the two hemispheres may affect linguistics. Perhaps the most important fact to consider in examining linguistics by the light of split-brain studies is this: our brains probably separate the sounds of words from their meanings (that is, phonemes from morphemes) when we hear ourselves or someone else speak. Of course, the two are processed together, but sound and meaning may go through different hemispheres before meeting again to cause thought or reaction. Robert Nebes (1977) speaks of this difference in Man's So-called Minor Hemisphere:

Figure 1. This is a schematic outline of the brain hemispheres drawn by Joseph E. Bogen (1977). According to Bogen, the outline suggests "the complementary dominance of the cerebral hemispheres for various tasks, summarizing the evidence from cases of lateralized lesions and from testing of patients with cerebral commissurotomy" (p. 142).

Figure One

This is a schematic outline of the brain hemispheres drawn by Joseph E. Bogen (1977). According to Bogen, the outline suggests "the complementary dominance of the cerebral hemispheres for various tasks, summarizing the evidence from cases of lateralized lesions and from testing of patients with cerebral commissurotomy" (p. 142).


L VISUAL
R FIELD
olfaction L nostril
olfaction R nostril
PROPOSITIONAL (and appositional) IDEATION
APPOSITIONAL (and propositional) IDEATION
R FIELD
L VISUAL

> Normal individuals are . . . better at recognizing and remembering melodies and chords presented to the left ear and thus going to the right hemisphere. This is in striking contrast to results achieved with verbal material; there they do better in the visual field [there are two visual fields: the left eye's and the right eye's] or ear projecting to the left hemisphere. (p. 101)

Hence pure sound, according to Nebes and others, is processed through the RH, and verbal meanings through the LH.

What importance does this division have for linguistics? For one, we may be able to recognize problems in learning linguistics as being problems with LH or "meaning" learning, as opposed to problems with RH or "sounding" learning. In fact, we may be able to predict which students will have which sets of problems: Barbara Meister Vitale (1982) explains later in this article, from *Unicorns Are Real: A Right-Brained Approach to Learning,* people tend to be LH or RH-dominant, and that we can teach them accordingly.

Another interesting idea for teaching linguistics is this: we might be able to teach sound differentiations better by speaking them into the student's left ear. In this way the sounds may go more easily to the RH. The basis for this idea lies in research in dichotic listening: research subjects are given two different sound signals simultaneously through earphones. The results suggest that nonverbal sounds are somehow processed better or faster when the sounds enter through the left ear; and meaningful/verbal sounds are somehow processed better or faster when they enter through the right (Fromkin, 1983, p. 371). Therefore, logically, we also might better teach meaningful/ verbal sound through the right ear. (Should we put all of our students on swivel chairs and have them turn left or right according to the type of lesson?) In addition, according to Stephen D. Krashen (1977) in *The Left Hemisphere,* "Blumstein and Cooper (1974) found a left-ear [RH] advantage . . . for the identification of intonation contours . . ." (p. 114).

Sound differentiation in linguistics might also be taught better if we added a tactile encouragement. "Commissurotomized patients" (patients who have had their commissures, or optic nerve fibers connecting the hemispheres, severed), according to Nebes (1977), "also excel with . . . tactile stimuli if they are presented to the [right] hemisphere", (p. 101). Vitale's (1982) way of handling this in *Unicorn* is to connect specific sounds with specific touches (p. 93). Vitale applies her ideas to children who are having difficulty learning letters, numbers and words: she asks them to make shapes stimulating to the touch. However, the concept would work in linguistic sounding, too: we could develop a system in which certain shapes correspond to certain sounds (for example, a hard, round ball for /o/ and sandpaper for /f/ and /v/; then we could use the shapes to show how different sounds are patterned in words.

Another interesting idea involving split-brain theory and linguistics is the way we read a page of writing, and why. In our culture we read from left to right, and our language is alphabetic and symbolic. Some cultures' languages, ancient and modern, read from right to left, and their language is iconic--pictographic or ideographic. They may also read in a steady, i.e. circular, l-to-r, r-to-l, l-to-r pattern. Is this a polarization l-to-r and symbolic, or r-to-l and iconic--which makes sense?

According to Fromkin and Rodman (1983), we now know that objects in our right-hand visual field (that which our right eye sees) are processed more by the LH; and objects in our left-hand visual field are processed more by the RH. In the act of horizontally scanning visual objects in front of us, we must move our eyes or our head from left to right or from right to left. If we scan toward the right (as in reading written English), our right eye is first to come into contact with the visual objects a microsecond before the left eye does. Conversely, if we scan toward the left, our left eye is first to come into contact with the objects before the right eye does. As our eyes scan a line of our Western symbolic writing toward the right, then, it is our right-hand eye and visual field which first come into contact with our symbolic/alphabetic writing. And it is our verbal/ logical LH which first processes the writing.

However, those who read iconic writing scan a line moving toward the left, and it is their left-hand eye and visual field which first contact the picture writing. And it is their visual/holistic RH which first processes the iconic writing. "It has been found that if normal subjects are shown an array of letters, . . . displays falling in the right-half field (left hemisphere) are processed serially, while those in the left-hand field (right hemisphere) are processed in parallel. The most likely explanation for this dissimilarity . . . is that there are two different ways of treating language material--

verbally and visual-spatially" (Nebes, 1977, p. 103).

If such polarization of two writing systems and their order of being read does exist, then the conclusion may be, simply, that we read pictures better moving leftward, and non-iconic writing better moving rightward. Perhaps, if our comic strips in the Sunday papers had no words in them, we would enjoy looking at them more in reverse order--and perhaps we could say the same for a large number of other iconic representations as well.

Having introduced our subject, and having applied it briefly to linguistics, let's now move on to a few of its possible uses in basic writing. By basic writing I mean that whole area in which people have learned how to write, but for some reason still cannot do so with average ease. Basic writers may be at primary or secondary school levels, or in college or beyond. They share a common problem, though: writing is a tough chore for them.

Barbara Vitale's (1982) *Unicorns* and another and better known book, *Drawing on the Right Side of the Brain* by Betty Edwards (1979), have a common viewpoint about students who have such difficulties: we may not be reaching students' hemispheres properly. Vitale, who had a severe learning disability when she was younger, posits that most nonorganic learning disabilities like hers are not a sign of stupidity or of a lack, but rather of an RH-dominant child in an LH-dominant learning system.

Edwards (1979), on the other hand, is an artist working in a discipline--art--which she says is normally an RH-dominant activity. Her poorer students are the ones who are more likely to be LH-dominant: they cannot click on their RH's well enough to draw.

Both teachers use RH techniques to train their students in using their RH's better and, in some situations, to train them to link their two hemispheres together. Let's look at some of these techniques.

Edwards' (1979) important idea in *Drawing* is that LH-dominant students trying to draw a picture by a logical, analytical, step-by-step process will fail because they are not seeing the visual whole. She corrects this by having them try two exercises: turning pictures to be copied upside down (so the pictures do not make logical sense or connection), and asking students to draw the spaces of a picture, instead of the objects in the spaces. Both of these exercises aim to force the RH to click on, to see the problem visually and holistically, rather than to see only its parts. In other words, Edwards is making tree-counting students look at the forest. In this she claims excellent results.

If her methods are transferrable to teaching remedial writers, I'd like to suggest her methods might work in this way: her upside down pictures might become, in writing, backward paragraphs or even backward sentences; and her drawing of spaces rather than objects might, in the unit of the sentence, become writing around punctuation, rather than punctuating around and in writing.

Two examples of backward sentence writing are as follows. One way to teach students the arbitrary and varied ways of developing sentences is to ask them to build sentences, phrase by phrase, in reverse. This makes the students see units more visually. Another method, one of rewriting, is to teach students to correct their errors of grammar and spelling by reading their uncorrected papers backward. Both of these techniques jar students out of seeing their writing in normal semantic units; instead the students begin to see visual/holistic patterns of syntactic arrangements and wholes. Instead of looking at writing as something scripted in stone or clay, students begin seeing it as moveable/visual pieces of a puzzle which can be arranged in several ways.

The same is true for Edwards' (1979) drawing of spaces, which I suggested we might transform into writing around punctuation. Students tend to see punctuation as a logical, step-by-step application of rules whenever they come across a verbal pause in their verbal-on-paper writing. An alternative to this is to first show students visual punctuation patterns (e.g., "SV, and SV" vs. "SV and V" where "S" = "subject" and "V" = "predicate"). Then we might show them how they can put different words and phrases within these punctuation patterns. The result might be a more holistic/visual sense of punctuating and of sentence structure--of visual word-group writing rather than of verbal pauses on paper.

Unicorn takes a slightly different approach. As mentioned above, Vitale (1982) uses RH techniques to teach RH-dominant children how to perform school tasks normally taught in LH-verbal/logical ways. She works with children who have learning problems--children who in college become basic writers. LH-verbal/logical ways are, she suggests, the dominant ways of teaching: we use verbal lessons and piece-by-piece memorization and testing, rather than visual/tactile holistic exploration and testing.

First, for those interested in applying her techniques thoroughly, she offers a screening checklist to determine hemispheric dominance (p. 20-32). It includes such elements as eye and hand dominance, hand position, musical testing, body symmetry, eye movements, and visual/auditory/haptic modality. Many of these traits are easily visible, without specific testing, to a perceptive teacher who has worked with a student for a time.

Once Vitale (1982) has diagnosed her children, she works with them in some rather unusual ways. One of her more important contributions may be in suggesting physical movement and touch as a key to teaching better writing and reading. Vitale offers an example of this:

> The concept that words can be divided into parts is difficult for the child who sees the word [and the world?] as a whole unit. Using body movement to emphasize the concept may help. Tell the children to

> imagine two body movements to go with. . . a two-syllable word. . . . It is important that they find their own movements. . . . As the children become proficient, proceed to more difficult words and body movements. (p. 46)

Likewise Vitale recommends "tactile writing": finger-tracing of words; making words from pipe cleaners, yarn, and the like; and sound-writing (p. 93).

Perhaps our own students who have trouble grasping or remembering certain forms of grammar or spelling would have an easier time of it if they were to somehow physically relate to--by body movement or touch--what they are trying to learn. Perhaps, for example, acting out words or sentences might help. Vitale (1982) also suggests using such RH techniques as playing with music or color. She has children--especially RH ones--choose a color each day to "ground" them emotionally, and she claims several dramatic successes in getting severely reading-deficient students to read at their age level by asking them to "See your favorite color in your head" and then to read intuitively (pp. 67, 83). For using music she suggests having students listen and move to it and sing their lessons (p. 102-4). She writes as follows about music:

> Many right-brained children have a great affinity for music and rhythm. They are able to listen . . . and have it change their mood or behavior. . . . Many parents and teachers find that when the right-brained child does his homework while music is playing he completes it sooner and often makes fewer errors. . . . When soft music, especially music at 4-4 time, is played while children are learning new material, not only is information they already have received stabilized but they also are able to think better and their focus of attention appears to be longer than most children's. (p. 102)

Perhaps we should encourage our basic writing students in college to write to music--or, for that matter, to sing their theses before putting them down on paper.

One of Vitale's (1982) most unique and startling ideas is, again, a body-movement technique, the cross-lateral march:

> When the screening list indicated that a child had one hemisphere that overshadowed the other, especially when the dominant hemisphere was the right one, a

> short-circuiting or blocking seemed to occur. Having these children move in a cross-lateral pattern seemed to balance the two hemispheres and alleviate this blockage. (p. 37)

More specifically, what she recommends is a marching exercise: the left leg (RH) and right arm (LH) move simultaneously, then the right leg (LH) and left arm (RH), and so on. Vitale claims that if a blocked student does this several times a day over a period of time, his or her reading difficulties will diminish dramatically.

Dare we suggest that such exercise will turn basic writers into good writers--or even, perhaps, good absorbers of basic grammar lessons? Perhaps, before tutoring certain students with grammar, mechanics, and other writing problems, we should ask them to march around the block--or swim or jog--first.

These all are tantalizing--and often very experimental--ideas for helping basic readers. Let's now turn to some slightly more sophisticated LH-RH techniques for teaching college composition.

College composition teacher and rhetorician W. Ross Winterowd (1986) has published an interesting article on linked-brain writing, "Brain, Rhetoric, and Style," in *The Territory of Language: Linguistics, Stylistics, and the Teaching of Composition,* edited by Donald McQuade (pp. 34-64). Winterowd's best developed idea is that we can easily divide our composition students' papers into two broad (and overlapping) categories: propositional and appositional. The propositional papers are those which generally show a rigid, formalistic style, tight organization, abstract ideas, and poor examples or details. The appositional papers are those which generally show a loose, informal or semiformal style, poor organization, poor abstract summarizing, and rich illustrations and details. In other words, Winterowd's propositional papers are abstract-idea essays, whereas his appositional papers are richly detailed narratives (p. 36). Winterowd says that the propositional themes are probably written by students who are LH dominant, and the appositional stories by those who are RH dominant.

One consequence of his idea is that we can divide our students into LH and RH-dominant students, even as Vitale (1982) and Edwards (1979) do. If this is so, and if we assume that both propositionality and appositionality are necessary to make excellent college papers, then one of our most important functions as writing teachers becomes this: to help our students learn to write well with both hemispheres, and in doing so we must help them learn to work better with their less-used hemispheres. "The fluent writer," says Winterowd (1986), "is a hemisphere-hopper" (p. 45).

The second consequence of Winterowd's (1986) propositional/appositional polarities then becomes a question for us: how do we teach these two hemispheric groups of students?

Vitale (1982) and Edwards (1979) already have spoken to us about using RH techniques to elicit RH academic behavior. In college composition classes this means we sometimes should go for the jugular of the unconventional: shake students loose from their safe visions and emotions--or ask them to expand on those wildly--so that they will produce a torrent (we hope) of RH images and feelings on paper.

What about the students who already are rich illustrators and emotionalists on paper? How do we get them to get to know their LH intimately in writing? Perhaps what we should do for these students is to continue teaching them the more traditional English skills in organization, logical thinking, and grammatical patterns. Many LH/RH theorists believe that our school systems create LH dominance. However, in the field of writing, at least, we should recognize that in some secondary schools just the opposite is true: some students are taught appositional RH writing at the expense of propositional LH writing: for example some students are allowed to elect creative writing classes in place of traditional composition classes.

However, perhaps we also should be quick to discover which of our students simply did not have adequate grounding in these skills in previous school years, and which of them may have the "learning disability" of being strongly RH-dominant persons. The former will quickly pick up the logic of LH writing; the latter, though, like Vitale's (1982) "backward" students, may require RH images, sounds, or body sensations to focus on LH writing methods. For such students as these we can, for example, present thesis structure in a visual format--as a map or drawing of some kind; or, perhaps, we can take LH verbal-logical tasks such as teaching students to write in standard English, and rephrase these tasks as RH visual-sensory tasks, instead, such as teaching students to consider their everyday English as "party language" and to imagine they are dressing their tongues for a formal dinner instead, one at which they must speak more formally.

Can we so easily bracket our students into LH and RH categories, though? This, perhaps is a third consequence of Winterowd's (1986) point of view: we may begin to see an exclusively LH or RH student lurking behind every brainstem. If we do this--if we notice only the extreme examples of LH or RH-dominant writing--we may miss the gradations between, and the intermixings of, the two poles.

This in turn could be dangerous. In fact, it is a danger to which Edwards (1979) and Vitale (1982) may stray close, too. We may be tempted to see individual students only as what their hemisphere-dominant skills imply. In real life, though, no one, probably, is completely LH or RH any more than he or she is all white or all black, all dumb or smart, all country or city. In real life, no matter our dominant tendencies in hemispheric thinking, most of us probably use both hemispheres for a variety of activities. We already are, in our natural state, "hemisphere-hoppers."

This fact may seem somewhat obvious to some. But emphasizing it here will help us realize that we cannot always expect to use LH and RH teaching techniques in a vacuum: we are not just filling up little-used left hemispheres in RH-dominant students, and vice versa. We also are asking them to apply the kind of thinking they use in RH situations to LH writing, and the kind of thinking they use in LH situations to RH writing. This is why, for example, such methods as asking an LH writer to write about her most embarrassing drunk, or an RH writer to write about how he would give directions for sharpening a pencil, work in the classroom. We are not asking students to process thoughts in entirely new ways, but rather to transfer a way of thinking from a life situation to a writing situation.

Some forms of writing are such close and tightly knit examples of combined LH/RH writing that they can stand alone as methods of encouraging linked-brain writing. Metaphor, for example, teaches propositional and appositional thinking at once: it combines abstract proposition with concrete RH image. Winterowd asks, "Does bi-hemisphericity explain the power of metaphor, which Longinus tells us, simply sweeps us away and thus is the most rhetorically cogent of the figures" (p. 167)?

One of our first classroom tasks, then, may be to present a multitude of LH and RH writing tasks, using techniques each of which is presented in both an LH and an RH way. At the same time we should, to the extent possible, encourage each individual to write using the kind of hemispheric writing--or intermixes thereof--to which he or she is not accustomed. For example, we can teach thesis structuring as a logical process and as a map-making event. And, in consideration of reading as a critical pre-writing activity, we can teach visual reading techniques (often known as speed reading or speed learning) as well as the normal verbal reading techniques.

Our most important task, though, as Winterowd (1986) certainly recognizes, is to teach students to be hemisphere hoppers not just from paper to paper, but more important, within each paper. In fact, Winterowd, for example, even offers a paragraph-building sequence which is a model of combined LH/RH writing: "Make a general statement about your English class. . . . Qualify, restrict, or explain that statement. . . . Illustrate the restricted statement three times" (p. 160). Such writing truly is linked-brain writing. It utilizes both Winterowd's appositional and propositional styles, both Edwards' (1979) spaces and the objects within the spaces, and both Vitale's (1982) sensory/instinctual and logical worlds. Such writing soars and posits, amazes and convinces. And knowing how to play with both LH and RH teaching techniques can help us teach linguistic concepts, basic writing, and college composition better. All we have to do is become hemispheric hoppers when we are teaching, too.

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Resumen. El autor revisa, analisa y discute la literatura de los hemisferios cerebrales para mejorar la enseñanza de enseñar el escribir.

Unas ideas nuevas se desarollan y se sugieren por uso en la clase de composición inglesa. El mejor de estos conceptos es 'el saltar hemisférico', el usar uno u otro de los hemisferios o ambos, en una manera integrada en el escribir.

* * *

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Speed Reading Improves SALT Achievement Much More

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Abstract. The author would like to explain his experience that the introduction of a speed reading technique to students just before a SALT language course itself will improve later achievement much more than before. However the extra time for the speed reading should be quite short and very easy so as not to disturb the essential SALT lesson. A new method of speed reading called "Joint System" (J.S.), published a few years ago by Kawamura in Tokyo seems to satisfy these conditions. This technique can be mastered by repeating the 90 minutes exercise five times by an accredited teacher, who utilizes sophisticated software with a personal computer. The author has noticed that the students seem very easily to have grasped their mother tongue sentence counterparts juxtaposed against the new language sentences as recited by the teacher during

the SALT active session. Achievement during the course and later seem excellent.

* * *

Kim's Method. Since a long time ago, Kim's method of speed reading has been well known in our country. But it takes a year or so to master it, and most students were not elgible for training, because of their individual characteristics. For example, their eyes should be healthy to withstand the severe training.

Stauffer's Method. On the other hand, a speed learning program was developed by Dr. R. Stauffer, Professor Emeritus, University of Delaware (1969). He has been the Founder and Director of the Reading Study Center at the University since he founded it in 1950. This method is especially suitable for engineering, scientific and technical readers, and may double reading speed. The present author received these complete materials from the publisher through the IEEE Service Center. By going through four self training books and four cassette tapes one can complete the course in about 40 hours. Although the result of double reading speed seems to be quite low, it does assure reasonable comprehension and high memory retention rate of target material.

Joint System. Mr. Akihiro Kawamura, President of the New Speed Reading Research Society of Japan, published a new method of speed reading, called "Joint System" (J.S.) in March (1988). This method is fundamentally different from the above two methods. The necessary training time is only five days and each day consists of 90 minutes of exercises. The teacher uses a personal computer with sophisticated educational software programs. The trainees do not have to have healthy eyes as in the case of Kim's method. Rather, myopia may temporarily be healed during the course of training. This method was not known to the public before his publication, because it was used exclusively in a private organization.

Japanese vs. English Sentences. So far results were demonstrated with Japanese sentences. Its application to English is now under study in the Center of the Society and soon will be completed. All Japanese newspapers and popular books are printed in a vertical style. But most of the technical and scientific books are printed in horizontal lines. In any case, Japanese sentences are composed of a mixture of Kana (phonetic) and

Chinese characters (hieroglyphic). The mean speed of reading Japanese sentences is said to be 400 charactes per minute (c.p.m.) Improvement of reading speed by J.S. training is at least 10 times if the training is given properly. Cases of even higher speed are often reported by the Society.

Now it might be interesting to consider the case of reading English sentences. The usual English reading speed is said to be about 250 w.p.m. and can reach 400 w.p.m. by simple self training (1949). This figure seems very interesting as a coincidence of words and letters in different respective cultures. Our people feel it easy to find the meaning of sentences intuitively from the mixture of Chinese hieroglyphic characters among the Kana phonetic characters. Perhaps it may be roughly regarded as the usual reading speed expressed in c.p.m. of Japanese sentences may be nearly equal to that of English sentences expressed in w.p.m. Ex-president Kennedy was said to have read at 1200 w.p.m. (1962).

Principle. The underlying principle of J.S. is explained by Kawamura as follows. The necessary time for comprehension can be reduced indefinitely by joining the visual image with unconscious memory of knowledge, information and experience. This final goal may be attained only by activating the reserve capacities of our brain at a subconscious level. This idea seems very similar to "Double-Planeness" as already suggested by Lozanov (1978).

Practice. The training consists of complicated programs which may be summarized as follows:

1. enlarging the visual angle,
2. speeding up ocular muscle movement,
3. glimpse training of full page sentences.

The training lasts 5x90 minutes. So the total necessary time is only 7 hours and a half. The students achieve a reading speed of 5 - 10 times faster than usual. The retention rate after speed reading training was statistically tested by the Society and published as about 30%.

Enlarging Visual Angle. A printed page of large characters is used for the exercise of enlarging visual angle. Students are asked to gaze at the central character on the page and asked respectively how far they can recognize surrounding characters. This exercise is very simple for Japanese printing because the characters in rows and columns are uniform in this case. On the contrary in the case of English, the words on the line are not uniform though the lines are uniform in the vertical direction. Even so, let me show you a special matrix of alphabetical characters just to show the principle:

F	F	F	F	F	F	F	F	F	F	F
F	E	E	E	E	E	E	E	E	E	F
F	E	D	D	D	D	D	D	D	E	F
F	E	D	C	C	C	C	C	D	E	F
F	E	D	C	B	B	B	C	D	E	F
F	E	D	C	B	A	B	C	D	E	F
F	E	D	C	B	B	B	C	D	E	F
F	E	D	C	C	C	C	C	D	E	F
F	E	D	D	D	D	D	D	D	E	F
F	E	E	E	E	E	E	E	E	E	F
F	F	F	F	F	F	F	F	F	F	F

Please gaze at the character "A" in the letter matrix and try to widen your visible range without moving your eyes. How far away from "A" can you recognize characters?

Speedy movement of ocular muscles. The exercise of moving ocular muscles needs a display screen controlled by a personal computer. By computer software, the sentences on the screen move quickly from right to left and left to right. Students' eye muscles are obliged to move quickly, which is not usual in daily life. By increasing blood flow in eye muscles, temporarily myopia may be ameliorated as a byproduct of this speed reading exercise.

Glimpse training. The personal computer display is an ideal device for glimpse training of full page sentences. Of course the training program is arranged in step by step order, and finally we can read a full page at one glance. Students are asked to read words first, then to read line by line, and then double or triple lines in parallel. Next read by blocks in certain areas on the page, and finally the full page just like a camera.

Kawamura prepared a software program in four steps of speed reading for beginners:

a. slow speed (similar to superimposed translation display on a movie screen),

b. 1.5 times faster than slow speed,

c. 3 times faster than slow speed,

d. 6 times faster than slow speed.

It might be impossible to read a full page of sentences within one second, just considering common sense. Kawamura says it is possible by programming computer software so as to display one full page of sentences only for one second, and then black out immediately. Most people may not read it at first, but soon they can after several days. Such a system of training only became possible with the emergence of personal computers.

Self training - self test. Students are asked to read respectively on the screen representative sentences in three different fields, for example, arts, sports and science. On - off switches set by the students themselves control the beginning and finish of their reading. Then the personal computer automatically estimates their reading speed in c.p.m. and displays it on the screen to encourage the students and enhance later achievement.

Book reading. After some exercises on the personal computer, students are asked to read actual books on popular topics. At the same time, they are taught to hold the book and turn over the pages at high speed. For this, the teacher gives signs of "ready", "start" and "stop" to the students. The teacher checks the stop watch, and asks the students how many characters they have read, for example in six seconds. Ten times this figure for six seconds will give their speed in c.p.m. This exercise is repeated again and again; the students master higher and higher speeds.

Inside the ALCR (Accelerative Learning Class Room). In our ALCR, Mr. Koji Uehara is an accredited teacher of J.S. speed reading. One high school girl trained by him got the highest reading speed of all students. After finishing J.S. training, she entered the SALT class in ALCR under the guidance of a foreign English teacher. Her progress is excellent. Before affiliation with ALCR she did not like to speak even Japanese. Her parents reported, "It was a miracle."

I myself, have experienced J.S. training, and thereafter noticed that Spanish sentences rushed to my eyes a few words before being read by the radio program's teacher. If students were trained in J.S. speed reading before a SALT course, their learning would be facilitated even more than usual.

Concluding remarks. As conclusion, let me express my opinion. It concerns the theoretical flow of information through the visual and audio senses. The quantity of information per unit time through our eyes is about 540 times larger than through the ears. Of course, the importance of the audio information in SALT should be admitted; especially the role of music in SALT is vital. Furthermore, verbal communications are the most important means in social activities.

On the other hand, we are in a giant flow of information. So the author believes speed reading as an efficient means of absorbing information at a high rate can be a strong help to SALT education.

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Resumen. El autor quiere explicar la experiencia que la introdución de una técnica antes de un SALT curso propio en una lengua mejorará la realización much más que antes. Además el tiempo adicional por la lectura rápida debe de ser muy corto y fácil a fin de que no trastornar la esencial SALT lección. Un nuevo método de leer rapidamente con el nombre El Sistema Juntado (S.J.) que se publicó hace unos años en Tokyo por Kawamura se parece que satisfacer estas condiciones. Se puede aprender esta técnica por la repetición cinco veces este de ejercício de 90 minutos por un maestro acréditado, quién utiliza un programa sofisticado con un orendador particular. El autor ha notado que los estudiantes parecen que haber comprendido muy facilmente las traduc-ciones en el idioma indígeno puestas contra las oraciones en la lengua nueva como el maestro las recita durante la SALT sesión activa. Se parece excelente la realización durante el curso y más tarde.

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